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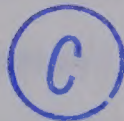
ATTITUDES, INFLUENCE AND INNOVATIVENESS: AN

ANALYSIS OF FACTORS RELATED TO INNOVATIVENESS

IN EDUCATIONAL ORGANIZATIONS

by

JOHN WIENS



A THESIS

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FACULTY OF GRADUATE STUDIES

The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies for acceptance, a thesis entitled "Attitudes, Influence and Innovativeness: An Analysis of Factors Related to Innovativeness in Educational Organizations" submitted by John Wiens in partial fulfillment of the requirements for the degree of Doctor of Philosophy.







## ABSTRACT

General systems theory was used as the basis for this study which was designed to examine a number of factors related to innovation in educational organizations. Several sub-problems were studied, dealing with the following topics: (1) attitudes and innovativeness, (2) interaction and innovativeness, and (3) teacher satisfaction as related to the congruence between attitudes toward change and system innovativeness.

The sample consisted of 697 teachers and principals in thirty-three schools located in three large urban school districts. Each of the respondents was asked to complete a number of questionnaires dealing with attitudes toward change in education, actual use of several innovative practices, interaction patterns in the schools, and satisfaction.

The data obtained by means of the questionnaires were analyzed by means of correlational techniques, chi square tests for independence and an analysis of variance. In addition, a step-wise regression analysis was performed to obtain a more complete analysis of the relationship between innovativeness and each of twenty-two predictor variables. In all, these variables were able to account for 87.03 per cent of the variance in innovativeness in the schools in this sample.

The one variable which accounted for the greatest amount of the variance in innovativeness was the attitude toward change held by the influentials in the school. When the principal was not included as one of the influentials, this variable alone was able to account for 35.52 per cent of the variance in innovativeness.

The attitudes toward change held by the teachers in each school were not significantly related to the innovativeness of the school. At





an individual level, however, there was a significant relationship between a teacher's attitude and innovativeness.

It had been expected that there would be a significant relationship between innovativeness and the amount of interaction in the school. This did not turn out to be the case, although a possible relationship may exist between the amount of reliance among teachers and the amount of innovativeness in the school.

The present study also leads to the conclusion that the satisfaction of teachers is not related to the congruence between their attitudes toward change and the actual amount of innovation in the school.

In general this study provides evidence that innovativeness in a system is related to the state of the system as well as to factors outside the system. Influence structures are particularly important in this respect, and the data suggest that the holders of formal authority are not necessarily the ones whose attitudes toward change will determine the level of innovativeness of the system. Instead, those persons who are at the centre of the communications networks, who are relied on for advice, and who are perceived to be influential by the other members of the system are the ones whose attitudes are most significantly related to innovativeness.





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## CHAPTER I

### THE PROBLEM

#### I. INTRODUCTION

During the last few years there has been a rapid increase in the number of publications dealing with change and innovation in organizations. Until recently one of the major concerns of administrators has been to increase productivity while maintaining stability within the organization. While productivity and stability are still important, it has become apparent that the increased tempo of change in every sphere of life is placing new and constantly changing demands on organizations of every kind.

An organization which remains static while its environment changes cannot hope to be effective for very long. In some cases the consequences of ineffectiveness are immediate and disastrous. In other cases, where the products of the organization's efforts are difficult to evaluate, it may take many years before the fact of and the consequences of ineffectiveness become apparent. The public schools are in this class of organizations. It is therefore important that educational leaders develop an understanding of the factors which combine to make innovation possible.

#### II. THE PROBLEM

The purpose of this study was to investigate such factors as attitudes and interaction within the school which might be related to the





amount of innovation which is taking place. This emphasis does not imply that internal factors are the only important factors in determining the amount of innovation. Indeed, Griffiths suggests that the major impetus for change is generally from the outside of a system (4, p. 431); a number of empirical studies support this generalization. Carlson, for example, found that more change takes place in school districts when vacancies in the superintendency are filled by outsiders rather than by persons who have had some experience in the district (2). Similarly, Rappel found that there is more change in a school when the newly-appointed principal comes from another school or district rather than from within the school (8, p. 52).

In spite of findings such as the above, it may be argued that the individuals who must finally act to implement change are often the teachers in the classroom. Miles, for example, suggests that studies like those by Carlson suffer somewhat from a "great man" tendency, and that not sufficient attention is being paid to internal organizational factors (5, p. 12). The present study was intended specifically to focus on such internal factors in educational organizations.

Formally, the problem may be stated in the form of a question: What are the factors which are related to innovation in educational organizations? Several sub-problems have been selected for specific study:

1. Is innovativeness in a school related to the attitudes with respect to change held by the teachers in the school?
2. Is innovativeness in a school related to the attitudes with respect to change held by the influentials in the school?





- 2a. What are the characteristics of the influentials in the various schools?
3. Is innovativeness in a school related to the interaction patterns which are found in the school?
4. Is the interaction among the teachers in the school related to the attitudes with respect to change held by these teachers?
5. Is the satisfaction of teachers related to the congruence between their attitudes toward change and the actual amount of innovation in the school?

#### Significance of the Problem

In a seminar on change held in Oregon in October, 1964, Matthew B. Miles asserted that

. . . there is an important, but often overlooked aspect of what is being said and done about planned change: the notion that any particular planned change effort is deeply conditioned by the state of the system in which it takes place. For example, properties of the organization such as communication adequacy, and the distribution of influence have a powerful effect on the speed and durability of adoption of any particular innovation, from English 2600 to data processing of teacher marks. To use an image from Gestalt psychology, specific planned change attempts have most typically been "in figure", occupying the focus of attention, while the organization itself has remained the "ground."

I believe this emphasis is both practically and theoretically unfortunate. It is time for us to recognize that successful efforts at planned change must take as a primary target the improvement of organization health -- the school system's ability not only to function effectively, but to develop and grow into a more fully-functioning system (5, pp. 11-12).

The purpose of the present study was to take up the challenge presented by Miles and to provide a beginning for the study of within-system factors related to innovation. Theoretically this study was





designed to apply selected aspects of systems theory to the problem of innovation in educational organizations.

One of the results of recent research and theory-building has been the development of the "change agent" concept (3, p. 202). Generally the change agent is considered to be a single individual, usually the principal, introduced into the system from the outside with the specific purpose of disturbing the equilibrium and thus forcing the system, through the functional interplay of its component parts, to achieve a new, and presumably more desirable level of equilibrium. Basically there is probably no reason to reject the theoretical reasoning underlying this approach, but the preoccupation with the single externally imposed change agent may be ignoring several important possibilities. One possibility is that innovativeness in a system may not necessarily be the result of the work of a single change agent; it may be the result of the combined efforts of several persons, each of whom is influential within certain specific task areas and with specific people. It is conceivable that these individuals, because of the restricted nature of their spheres of influence or interest, and because of the fact that they are probably not holders of formal positions of authority, have not been as visible as they have been effective. Rogers, has found, for example, that opinion leaders, while they have more social participation than their followers, are not necessarily the formal leaders in their communities (9, p. 241). He also suggests that practically no research attention has been paid to the possible influence of opinion leaders in discouraging change (9, p. 210). Finally, he indicates that there is a need for sociometric studies designed to locate opinion leaders (9, pp. 54-55).



Another possibility, which follows from the above, has important practical implications. It would appear that the single change agent concept has overlooked, to some extent at least, the effects of change on a system which is not prepared for change, a system which, in Miles' words, is lacking in organizational health. Downey sounds a warning in this regard:

It should be emphasized that when major imbalances are induced in an organization, the need for direction immediately becomes acute, so it is advisable to use the disequilibrium technique with considerable caution and premeditation (3, p. 202).

Systems theory, of course, would lead us to expect that the system will collapse if it is unable to adjust to continually increasing stress (6, p. 527). Thus it is possible that the single, unaided change agent's only success might be to create such a state of disequilibrium that the system would begin to disintegrate. In practical terms, this could lead to lowered job satisfaction among teachers and eventually to a high rate of teacher turnover.

From the foregoing it may be seen that this study has both practical and theoretical importance. A test for certain major generalizations based on systems theory is provided in an area which is of immediate concern to practising administrators. On the basis of the present findings it should be possible to develop further those aspects of systems theory which have a bearing on innovation in educational organizations. At the same time the results of this research should make it possible for principals and superintendents to obtain a clearer understanding of the interrelationships among the factors which are related to innovation in their schools.





### III. DELIMITATIONS AND LIMITATIONS

#### Delimitations of the Study

In order to minimize the effects of external factors which may vary considerably from one district to another, the sample of schools in the present study was selected from three large city school districts. The sample was further restricted to include only schools enrolling grades one to nine, and having a staff of at least twelve teachers, including the principal. In all, 664 teachers and 33 principals were involved in the study.

#### Limitations of the Study

The present study was not intended to provide an exhaustive test for every generalization with respect to innovation which may be derived from general systems theory. One important aspect not covered by the study is the time factor and the various phases involved in the adoption process. Selected factors and generalizations were chosen for this study with the expectation that this selection would provide a unity which was both conceptually and experimentally manageable.

An additional limitation results from the decision to restrict the study to only three large city school districts. A restriction which was necessary in order to prevent contaminating variables from affecting the study obviously places limitations on the generalizability of the findings. In this connection, Carlson states:

It seems that large cities are not looked to for innovation as they once were. There has been speculation that now the demands of the position in large cities place a very heavy burden on public relations and thus men from inside, men who know the lay of the land and are themselves known, are best equipped to handle the changed position (2, p. 14).





If Carlson's statement is valid for the Province of Alberta, it is possible that the present study is limited in that it does not include schools from smaller districts which may well be among the most innovative in the province.

#### IV. DEFINITION OF TERMS

##### Organization and System

An organization is a set of relationships among people. The formal organization is that set of relationships which is officially recognized, while the informal organization is the spontaneous set of relationships which exists independently of official recognition. Taken together as a dynamic unity, the formal and the informal organization are a special case of a system. In general, a system may be simply defined as a "complex of elements in mutual interaction" (4, p. 428). Because of the importance of this concept in the present study, a more comprehensive discussion of the term is undertaken in the next chapter.

##### Interaction

Interaction refers to the activity and behaviour of the members of a system by means of which they influence each other. Influence is the ability of one person to originate action for another person. An influential is a person who exercises influence over another. In the present study, an influential is identified as one who meets at least one of the following conditions:

1. He has reciprocated communication links with at least one quarter of the remainder of the staff;



2. He is relied on for advice by at least one quarter of the remainder of the staff;
3. Influence is attributed to him by at least one quarter of the remainder of the staff; or
4. He has formal authority.

Communication refers to ". . . the transference of thought or feeling from one person to another" (1, p. 9). A communication link exists when two persons both indicate that they communicate with each other. A person's communications scope includes those persons with whom he has communication links. The net of communication links among the members of the system is referred to as the communications network.

Reliance refers to the willingness of one member of an organization to rely on another for advice.

Attributed influence is the influence which is attributed to a member of the organization by other members of the organization.

Authority is socially sanctioned power. In this study, the only person who is defined as having authority is the principal of the school. While the principal's superiors are obviously persons with authority, they do not come within the scope of the present study.

An isolate is a person who has no reciprocated communication links with any other staff member.

#### Change, Adaptation and Innovation

These terms are frequently used interchangeably in the literature. This practice is also followed in this report. In general, an innovation is a practice which is relatively new to a person or to a system, and innovativeness is the tendency to adopt or to experiment with innovations.





### Attitude

An attitude has been defined by Murray as ". . . a relatively permanent disposition to evaluate some entity negatively or positively. . . ." (7, p. 453). This concept will be discussed further in Chapter III.

### Satisfaction

Satisfaction refers to the degree to which a teacher indicates that he is favourably or unfavourably disposed toward various aspects of his present teaching position as measured by the Teacher Satisfaction Questionnaire.

## V. ORGANIZATION OF THE THESIS

The theoretical framework on which the research was based is presented in the next chapter, together with the hypotheses which were developed for specific study. Chapter III deals with related theory and research. Chapter IV is concerned with the development of the research instruments and the collection of data, and includes some discussion of the characteristics of the respondents, the diffusion of innovations and the statistical treatment of the data. Chapters V, VI and VII are devoted to a discussion of the findings as they relate specifically to the research hypotheses. Finally, Chapter VIII provides a summary of the study, including a discussion of the implications of the results for practising administrators and for those who are concerned with the further development of theory.





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## CHAPTER II

### THEORETICAL FRAMEWORK AND HYPOTHESES

Since the major theoretical basis for this study is provided by general systems theory, the first part of this chapter consists of an introduction to the major concepts involved in systems theory. Following this, some of the properties of systems are discussed, and specific hypotheses dealing with innovation and attitudes toward change are developed. The chapter concludes with a summary of the hypotheses within the framework of the sub-problems listed in Chapter I.

#### I. SYSTEMS THEORY: CONCEPTS AND PROPERTIES

Systems theory has been developed in recent years in response to a widely-felt need for a common language which will enable scientists in a variety of disciplines to communicate more effectively with one another (6, p. 11). Although the first yearbook of the Society for the Advancement of General Systems Theory was not published until 1956, the potential usefulness of the systems approach has impressed scholars sufficiently to lead to widespread use of many of the concepts and constructs which are important in general systems theory. It is proposed in the following pages to deal with the most important of these, beginning with the central concept: system.

#### System

A comprehensive definition of this term has been provided by Allport who states that a system is





. . . any recognizably delimited aggregate of dynamic elements that are in some way interconnected and interdependent and that continue to operate together according to certain laws and in such a way as to produce some characteristic total effect. A system in other words, is something that is concerned with some kind of activity and preserves a kind of integration and unity; and a particular system can be recognized as distinct from other systems to which, however, it may be dynamically related. Systems may be complex; they may be made up of inter-dependent sub-systems, each of which, though less autonomous than the entire aggregate, is nevertheless fairly distinguishable in operation (1, p. 469).

As has already been indicated, Griffiths has reduced this definition to its minimum essentials when he defines a system simply as "a complex of elements in mutual interaction" (9, p. 428).

From these definitions it may be seen that a system may be defined for practical purposes in a great variety of ways. Bertalanffy states:

A first consequence of the existence of general system properties is the appearance of structural similarities or isomorphies in different fields. There are correspondences in the principles which govern the behavior of entities that are intrinsically, widely different. This correspondence is due to the fact that they can all be considered, in certain respects, as "systems" . . . (18, pp. 1-2).

Boulding suggests that systems can be thought of as existing on a number of levels (6, pp. 14-16). He postulates the existence of nine such levels, which are presented in summary form in Table I. The present study focuses on Boulding's eighth level, the level of the social system. The particular social system under consideration is the school, and the elements of the system are the staff members who work in the school.

### Boundary

To be useful, the concept "system" must be defined in a specific and limited manner which makes it clear which elements belong in the system and which belong outside. The term "boundary" is used to indicate that such a separation of elements has been made. A useful





TABLE I  
LEVELS OF SYSTEMS  
(after Boulding<sup>1</sup>)

Level	Description	Example
1. static structure	the level of frameworks, the geography and anatomy of the universe	arrangement of atoms in a crystal
2. simple dynamic system	has predetermined, necessary motions	clockworks
3. cybernetic system	with control mechanism, the homeostasis model	furnace making use of thermostat
4. "open system"	self-maintaining by means of inputs and outputs	the cell
5. genetic-societal system	division of labor within the system	the plant
6. animal system	has mobility and self-awareness; specialized information receptor sub-systems	animals
7. the human level	ability to symbolize; he "knows that he knows"	man
8. social systems	man in the society of his fellow-man	the family, community, the church, the work group, the industrial or professional organization
9. transcendental systems	"the ultimates and absolutes and the inescapable unknowables, and they also exhibit systematic structure and relationship."	

<sup>1</sup>Summarized from Kenneth Boulding, "General Systems Theory -- The Skeleton of Science," Ludwig von Bertalanffy and Anatol Rapoport (eds.), General Systems: Yearbook of the Society for the Advancement of General Systems Theory, I(1956), pp. 14-16.



definition of this term has been provided by Chin, who refers to it as ". . . the line forming a closed circle around selected variables, where there is less interchange of energy (of communication, etc.) across the line of the circle than within the delimiting circle" (7, p. 203).

For the purposes of the present study, the boundary of the system is drawn so as to include the persons who make up any given school staff, including the teachers and the principal. Outside the boundary of the system are persons such as the superintendent, supervisors, school board members and the general public.

### Environment

The exclusion from the system of persons who are obviously concerned with the operation of the system, and who, no doubt, have an important effect on the system, makes the concept "environment" necessary. Greenfield has defined this term by stating that ". . . the environment of a system is everything beyond its boundaries which affects or is affected by the operation of the system" (8, p. 22). Hearn distinguishes between the proximal and the distal environment, the former being that part of the environment of which the system is aware, and the latter being that part which affects the system but is beyond the awareness of the system (10, p. 42).

To relate the above definition of environment to the present study, the environment of any specific school "system" includes specific persons such as the superintendent, supervisors and school board members. More broadly, the environment may be seen as described by Maccia:

The environment . . . of a school is the physical, biological, psychological, and social context in which it is located. The social context includes political, religious, fraternal, occupa-





tional, and other like social groupings. The context varies with the type and level of school. Thus, the political grouping could be the community or state or nation or a grouping of nations (14, p. 10).

### Sub-System and Supra-System

Greenfield states:

From the definitions of environment and boundaries, it is evident that systems are hierarchical arrangements of smaller systems, with the definition of the system depending on the unit of analysis (8, p. 23).

In the present study, the school (including the staff, but excluding the pupils) is the system; the environment as already described is the supra-system, and the individual staff members, including the teachers, the principal, and the various influentials among the teachers, are sub-systems. In addition, specific groups of teachers who tend to form relatively stable formal or informal relationships, may be regarded as sub-systems of the main system.

### Attributes of Sub-Systems

Each of the sub-systems in a system is characterized by certain attributes which affect the functioning of that sub-system, and which consequently affect the functioning of the system as a whole as well. In the case of inanimate systems, the attributes of the sub-systems may be described in relatively simple terms such as weight, size, shape and hardness; but in the case of systems whose members are living individuals, it is also necessary to take into account a large number of inferred attributes such as personality, needs, and attitudes. Kretch and Crutchfield consider attitudes to be of major importance for individuals. They say that





. . . attitudes serve several important functions in the individual. They give continuity to his personality, they give meaning to his daily perceptions and activities, they serve in his attempted achievement of various goals (12, p. 156).

An attitude can thus be seen as an attribute which is formed on the basis of such other attributes as personality, needs, and characteristic modes of perception. On the assumption, therefore, that attitudes are among the more important attributes which guide individuals in their actions, it is suggested that any study related to innovation in systems such as schools must take into account the attitudes toward change held by the teachers in those schools. It was therefore hypothesized that the amount of innovation which takes place in a school is related to the attitudes toward change held by the teachers in the school.

#### Steady State and Self-Regulation

Hearn states that systems are of two types: open and closed, ". . . the major difference being that closed systems are isolated from, whereas open systems are related to and exchange matter with, their environment" (10, p. 40). A major characteristic of closed systems is their tendency to achieve a state of equilibrium. Allport gives the example of a tea kettle of boiling water in a closed room. So long as there is no input of energy into the water in the kettle, the heat from the boiling water is gradually given off into the atmosphere of the room until the temperature of the water is the same as the temperature of the room. At this point there is no further movement of heat energy and the system has reached a state of equilibrium: its most probable state. This state of equilibrium, also referred to as entropy, is the ultimate state of every closed system (1, pp. 474-475).





Bertalanffy suggests that open systems, unlike closed systems, can avoid the increase of entropy (18, p. 4). This is possible because the open system is in a dynamic relationship with its environment, inasmuch as it exchanges matter with its environment. When this exchange is relatively constant, the open system tends toward a stationary state similar to the equilibrium of the closed system, but it maintains this state in a continuous inflow and outflow of materials (10, p. 23). This state, referred to by Lewin as one of "quasi-stationary equilibrium," (12, p. 235), is usually simply known as the "steady state" (10, p. 41).

Chin, who uses the term "equilibrium" to refer to the steady state in both open and closed systems, claims that a system in equilibrium reacts to outside impingements in three characteristic ways:

- (1) by resisting the influence through refusing to acknowledge its existence,
- (2) by resisting the disturbance through bringing into operation the homeostatic forces that restore balance, and
- (3) by accommodating the disturbances through achieving a new equilibrium (7, p. 205).

When an impingement or input from the outside becomes greater than the capacity of the system to cope with it, stress is produced in the system. Miller states that ". . . living systems respond to continuously increasing stress first by a lag in response, then by an over-compensatory response, and finally by catastrophic collapse of the system" (15, p. 527). The manner in which the system attempts to deal with input overload is described by Hearn who says that the system may





arrange the input in order and try to deal with one item at a time, or it may close itself if this approach appears futile. If these attempts to cope with the input fail, the system breaks down (10, p. 69).

Interaction: The Dynamic Interplay of Sub-Systems

Under normal conditions, when the system is capable of dealing adequately with the inputs fed into the system from the environment, the steady state is maintained by the dynamic interplay of its sub-systems. Each sub-system has its function to perform and does so in relation to all of the others (10, p. 46). The manner in which each sub-system performs its functions is determined in part by its own attributes and functions, and in part by its interaction with the other sub-systems, each with its own attributes and functions.

In social systems whose elements are living individuals the interaction among sub-systems occurs in several characteristic ways. First, system members communicate with each other, and in so doing they make each other aware of their attitudes and feelings. Second, by relying on each other for advice, the members of the system are able to make use of the expertise which they perceive in their colleagues and to adjust their behaviour accordingly. Third, certain members of the system are perceived by their colleagues to be more influential than the rest, and there is some evidence which suggests that system members tend to pattern their behaviour after such persons (5, p. 21). Finally in a social system such as a school, where a formal authority structure exists, the interaction between the members of the system and the person who holds formal authority is likely to affect the functioning of the system.





The four methods of interaction mentioned above are of considerable importance in the present study, and so the next section is devoted to a more thorough discussion of each.

## II. THE INTERACTION DIMENSIONS OF A SOCIAL SYSTEM

### The Communications Dimension

After a study of curriculum development as it is affected by the informal organization within a social system, Blocker and McCabe concluded that the communications dimension was the heart of their study design (4, p. 105). Similar conclusions have been reached by others, and certainly the importance of communication is a matter of common observation, but the difficulties of studying communication in all of its intricacies have discouraged most attempts at a thorough investigation of patterns of communication in large organizations.

Research has been attempted more frequently in small groups than in large organizations, and has led to the identification of certain basic communication patterns, such as those illustrated in Figure 1. The numbers shown at each position in the various networks indicate the total number of group members who perceived the individual in that position as leader in an experiment conducted by Leavitt and reported by Bavelas (2, p. 677). Keltner reports similar findings and states that ". . . the persons at the centre of the communications network tend to become the leaders of the group and to assume most of the decision-making functions" (11, p. 28). It is interesting to note that the tendency for leaders to emerge is present to some extent even in the circular situation depicted by network A in Figure 1. These findings would



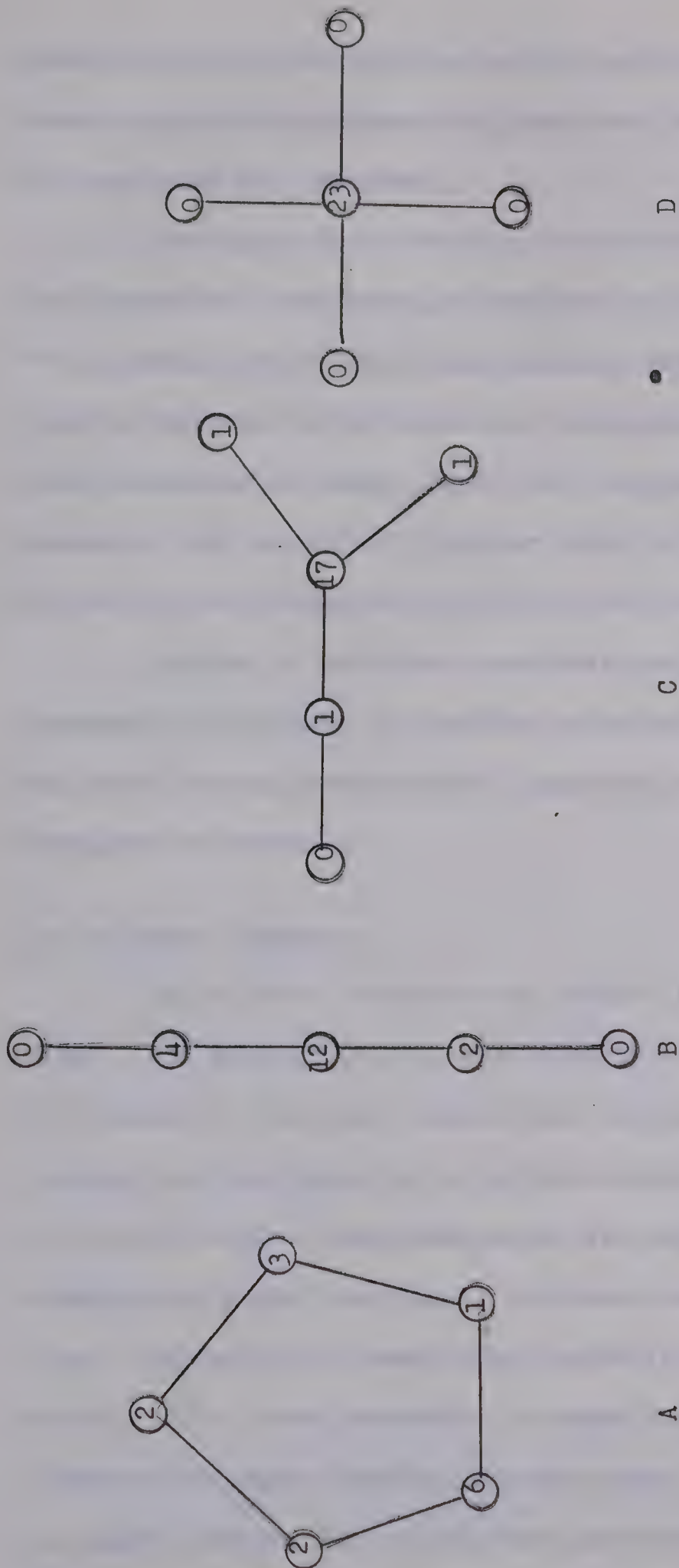


FIGURE 1  
EMERGENCE OF PERCEIVED LEADERS IN DIFFERENT  
COMMUNICATION PATTERNS (AFTER LEAVITT)





seem to indicate that opinion leaders in the informal organization may have considerable influence and power with respect to matters which are of importance for the group.

Findings such as those referred to above are in keeping with the theoretical consideration expressed by Blocker et al as follows: "The dynamics of the system are personal interactions; thus, a communication is the vehicle for activating the system" (5, p. 16). It would seem reasonable to expect, then, that persons who are important in the communications network of a system would be important in terms of activating the system and in giving direction to system activity.

In view of the above considerations, it was decided for the purposes of this study to consider as an influential any person on the staff who has communication links with at least one quarter of the remainder of the staff.

### The Reliance Dimension

The reliance dimension has special implications for innovation. Rogers, for example, reports that even those persons who are not inclined to be eager to adopt new methods will nevertheless go for advice to persons whom they perceive to be knowledgeable about new techniques (17, pp. 238-239). Thus persons who are relied on for advice are in a particularly good position to influence the system in terms of innovation. The sources of demands for innovation and change could be many and varied, but it seems reasonable to expect that teachers will tend to "check" with those of their colleagues whom they perceive to be reliable and expert, before they adopt a new procedure.

It should be pointed out that persons who are relied on for





advice will not always favour innovation. Rogers, who refers to influentials as "opinion leaders," found in one study that many farmers were persuaded by their opinion leaders to reject the use of fertilizers even though these fertilizers had been demonstrated experimentally to be of considerable benefit (17, p. 208).

Consistent with the method used for identifying influentials on the communications dimension, it was decided to consider as an influential any teacher who is relied on for advice by at least one quarter of the remainder of the staff.

An interesting finding reported by Rogers is that opinion leaders or influentials conform more closely to system norms than do the average members (17, p. 233), and that the most innovative persons in a community are not infrequently rejected by the majority (17, p. 193). This rejection may occur at either end of the innovativeness continuum, depending on the prevailing attitudes within the system. It is therefore hypothesized that teachers whose attitudes with respect to change differ from the attitudes held by the teachers as a group will not be relied on for advice by the other members of the staff.

#### The Attributed Influence Dimension

Numerous studies have shown that persons tend to pattern their behavior after that of persons whom they perceive to be successful (5, p. 21). Blocker et al state:

Our perceptions are not always accurate but we react to them as reality; and persons seek support from, imitate, and are receptive to suggestions from high status persons. Therefore, the more members who perceive X to be influential the more important X will be in the influence structure (5, p. 21).

The method of identifying influentials on the basis of the



attributed influence dimension was like that used for the communications and reliance dimensions; that is, a person was considered to be an influential if at least one quarter of the remainder of the staff perceived him to be influential.

As was indicated above, system members are likely to be rejected if they differ in their opinions and attitudes from the norms of the system. It is therefore hypothesized that teachers whose attitudes with respect to change differ from the attitudes held by the teachers as a group will not be perceived to be influential by the other members of the staff.

#### The Authority Dimension

Blocker et al say:

It is stating the obvious to indicate that investing member X with authority will affect his power to influence. When invested with authority, X will be able to reward and punish -- two bases for power. His prestige will also be enhanced. In addition, it is noted that members are inclined to desire association with authority figures (5, p. 22).

It would seem reasonable to expect that the attitudes toward change held by persons with authority in a social system will be important in determining the innovativeness of the system. Accordingly it was decided to include the principal as one of the influentials in this study.

#### Interaction Dimensions: Summary

The four interaction dimensions discussed above were the communications dimension, the reliance dimension, the attributed influence dimension, and the authority dimension. These have led to the identification of persons who are influentials in the system. In this study, these are persons who have communications links with at least one quarter of the





remainder of the staff, who are relied on for advice by at least one quarter of the remainder of the staff, to whom influence is attributed by at least one quarter of the remainder of the staff, or who are principals.

On the basis of the above definition of influentials, and on the basis of the discussion regarding the dimensions of a social system presented in the preceding sections, it was hypothesized that the amount of innovation which takes place in a school is related to the attitudes toward change held by the influentials in the school.

### III. INTERACTION AND ATTITUDES

According to Blocker et al, a system is not only activated by personal interactions, but individual members are also likely to undergo change as a result of these interactions. They say:

In analyzing a communication from member X to member Y, one must recall that the psychological field of member Y is an open system. When X communicates to Y, system Y is modified by this intrusion (5, p. 16).

The direction of this modification can be predicted on the basis of general systems theory. It has been stated earlier that all systems tend to move toward a steady state, in which differences among sub-systems tend to be minimized. In the case of attitudes, it is therefore expected that these will become relatively similar throughout the system after a certain amount of interaction has taken place.

Reference group theory supports the above contention. Ratsoy states that reference group theory

. . . recognized that it is man's membership in certain -- not always voluntarily selected groups -- which to a great extent moulds his attitudes and values, and influences his ways of seeing and doing things (16, p. 17).





He goes on to suggest that ". . . with sufficient interaction among members, an individual's perception of others' evaluations of him becomes quite accurate due to the continuous feed-back he received. . . ." (16, p. 20).

The concept of "feedback", of course, has always been of great importance in general systems theory. This process is that by which a system, or sub-system of a larger system, becomes aware of the impact of its output upon the environment. Feedback is functional for the system in that it enables the system to ". . . adjust future conduct by past performance." (19, p. 33).

More feedback is possible in a social system when interaction is increased, and therefore the movement toward the steady state should be speeded up when interaction increases. And since the communications dimension of the social system provides the major vehicle for interaction, it was hypothesized that there is greater similarity of attitudes with respect to change in schools in which the communications network is well developed than in schools in which the communications network is not well developed.

If communication networks provide the vehicle by which normative influences are made effective, it is reasonable to expect that persons who are not integrated into the communications network of a social system may hold views and have attitudes which are not similar to those of the main group. Indeed, if members of a system are to maintain an independent attitude which differs from the norms of the group, it may be necessary for them to withdraw from interaction with the group. And the system itself will tend to reject a sub-system or member which hinders



the development of the steady state. It was therefore hypothesized that teachers whose attitudes with respect to change differ from the attitudes held by the teachers as a group will be isolates in the communications network.

#### IV. INTERACTION AND INNOVATION

Open systems maintain their steady state with relative ease while inputs from the environment remain constant. But when inputs change, the system will react in one of two ways. If the norms of the system do not favour change, the system will react to the changed input in a manner which denies the need for change or innovation. But when the norms of the system do favour change, the system will attempt to develop a new steady state which takes into account the demands of the new inputs. This new steady state is developed in the same way that the original steady state was developed, namely, by the dynamic interplay of the sub-systems. For the social system this means, again, that there will be increased interaction among the members of the system. The amount of interaction will be in proportion to the strength of the demand for change made by the new inputs. And since the interaction in a social system occurs on the communications, reliance, and attributed influence dimensions, it is expected that these will be more fully developed and active in innovative schools than in non-innovative schools. It was therefore hypothesized that:

- (a) The amount of innovation which takes place in a school is related to the number of reciprocated communication links in the school.





- (b) The amount of innovation which takes place in a school is related to the number of reliance links in the school.
- (c) The amount of innovation which takes place in a school is related to the amount of influence which is attributed to each other by the members of the staff.

## V. INNOVATION AND SATISFACTION

In a stable system, the members of the system tend to act together either to maintain the present steady state or to achieve a new steady state after a disturbance (2, p. 195). In other systems, however, various degrees of instability may make it difficult for the members to act in unity. And even in stable systems, stress may be produced when the demand inputs are inconsistent with the norms of the system. Thus it may occur that a school is expected by the supra-system or some other part of the environment to adopt an innovation which is not favoured by the teachers in that school. Conversely, it may occur that a school with innovative norms finds it difficult to be innovative due to restrictions imposed by the environment or the supra-system. In either case, general systems theory would predict that stress will be produced in the system. It is likely that this stress will result in dissatisfaction among the members of the system. It was therefore hypothesized that the satisfaction of teachers is related to the congruence between their attitudes toward change and the actual amount of innovation in the school.





## VI. SUMMARY OF HYPOTHESES

The hypotheses which were developed in this chapter will now be arranged for convenience within the framework of the sub-problems which were presented in the first chapter. In addition, the various relationships are presented in the form of a diagram in Figure 2, in which the numbers refer to the numbers of the hypotheses as they are arranged in the summary to follow.

### Sub-Problem 1

"Is innovativeness in schools related to the attitudes with respect to change held by the teachers in the school?"

Hypothesis 1.1. The amount of innovation which takes place in a school is related to the attitudes toward change held by the teachers in the school.

### Sub-Problem 2

"Is innovativeness in schools related to the attitudes with respect to change held by the influentials in the school?"

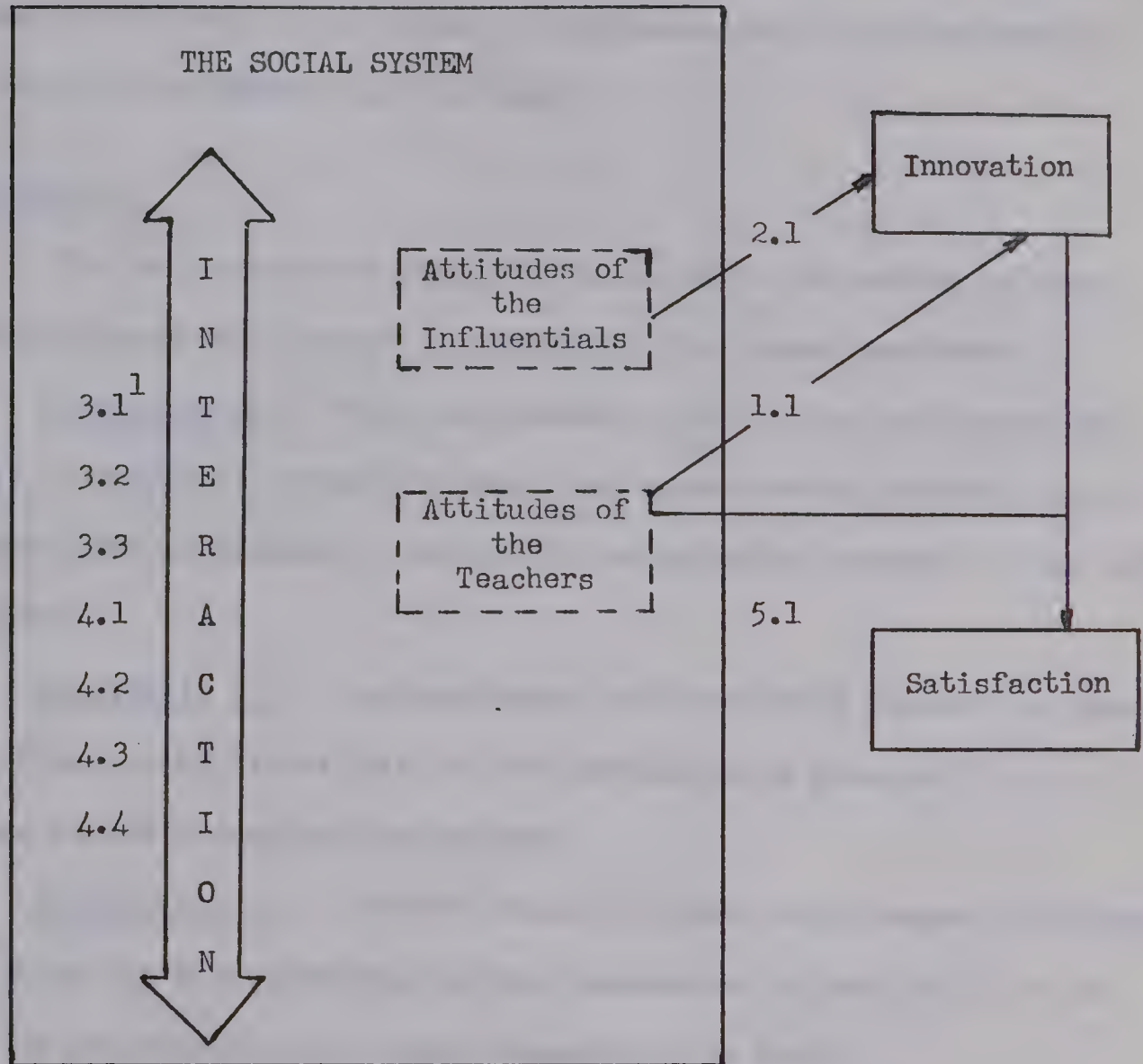
Hypothesis 2.1. The amount of innovation which takes place in a school is related to the attitudes toward change held by the influentials in the school.

### Sub-Problem 3

"Is innovativeness in schools related to the interaction patterns which are found in various schools?"

Hypothesis 3.1. The amount of innovation which takes place in a school is related to the number of reciprocated communication links in the school.





<sup>1</sup>Numbers refer to the numbers of the hypotheses used in text.

FIGURE 2

FACTORS RELATED TO INNOVATION IN EDUCATIONAL ORGANIZATIONS





Hypothesis 3.2. The amount of innovation which takes place in a school is related to the number of reliance links in the school.

Hypothesis 3.3. The amount of innovation which takes place in a school is related to the amount of influence which is attributed to each other by the members of the staff.

#### Sub-Problem 4

"Is the interaction among the teachers in the school related to the attitudes with respect to change held by these teachers?"

Hypothesis 4.1. There is greater similarity of attitudes with respect to change in schools in which the communication network is well developed than in schools in which the communication network is not well developed.

Hypothesis 4.2. Teachers whose attitudes with respect to change differ from the attitudes held by the teachers as a group will be isolates in the communications network.

Hypothesis 4.3. Teachers whose attitudes with respect to change differ from the attitudes held by the teachers as a group will not be relied on for advice by the other members of the staff.

Hypothesis 4.4. Teachers whose attitudes with respect to change differ from the attitudes held by the teachers as a group will not be perceived to be influential by the other members of the staff.

#### Sub-Problem 5

"Is the satisfaction of teachers related to the congruence between their attitudes toward change and the amount of innovation in the school?"

Hypothesis 5.1. The satisfaction of teachers is related to the





congruence between their attitudes toward change and the actual amount of innovation in the school.

## VII. SUMMARY

In this chapter the theoretical basis for the study has been presented. Ten hypotheses were developed, five dealing with innovativeness in schools, four others concerned with interaction and attitudes in a social system such as a school, and one dealing with teacher satisfaction. Further discussion of the literature relating to this study is presented in the next chapter, and the analysis of the data relating specifically to the hypotheses is presented in Chapters V, VI and VII.



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## CHAPTER III

### RELATED THEORY, RESEARCH AND GENERAL LITERATURE

In the first chapter the problem was stated as follows: "What are the factors which are related to innovation in educational organizations?" In the second chapter specific hypotheses were developed on the basis of general systems theory. It was stated that attitudes should be important correlates of innovativeness, as should patterns of interaction among the members of the social system. It was also stated that teacher satisfaction might be related to the congruence between the teacher's attitude toward change and the actual amount of innovation in the school.

The purpose of the present chapter is to review some of the theory, research and general literature as it relates to the problem under consideration. The first section will deal with innovation and change, the second will focus on attitudes and attitude change, and the last section will deal briefly with satisfaction.

#### I. INNOVATION AND CHANGE

One of the recurring themes in almost all the literature dealing with change and innovation is that, in every system, there are always two forces at work, one seeking change and diversity, the other seeking to maintain the status quo. Thus Williams, in discussing the study of change as a concept in cultural anthropology, states that "change and persistence are reciprocals of the same phenomenon of cultural dynamics" (29, p. 17). He goes on to say:

Americans tend to be both innovative and conservative at the same time, while seeking change many Americans cling to ways



which persist from another time and cultural milieu. The American system of public education clearly reflects the stresses of the contradictory ideal values of 'change is good/change is bad.' (29, p. 18).

The same general point is made by others. Hobbs states: "Social change is at the same time 'normal' and 'deviant'" (13, p. 20). Rogers indicates that ". . . tradition may lend stability to a social system where it is undergoing rapid change and the danger of disorganization" (22, p. 62). And Bennis, in discussing organizations as bureaucracies, states that all organizations are goal-seeking units, but that at the same time they must (1) maintain the internal system, and (2) change the system so as to adapt it to the demands of the external environment (2, p. 7).

In Chapter II it was indicated that, in general, the internal dynamics of a system tend to move the system to the steady state. This would lead us to expect that change in a system is the result of the system's efforts to adapt to changes in the outside environment (10, p. 431). Hobbs supports this view, and cites several examples which indicate that changes in schools have come about as a result of technological developments outside the school, particularly developments in transportation and communication (13, pp. 20-21).

Other writers have pointed out that schools change too slowly, that educators generally, and administrators particularly place too high a value on the maintenance of a smooth, cohesive, functioning unit (12, p. 46). It would appear that often the mere development of new practices and facilities is not a sufficient stimulus for the schools to change. To provide a better understanding of the necessary conditions for change, Hobbs has outlined five stages of change. These are





(1) development of innovations, (2) diffusion of innovations, (3) legitimation or advocacy, (4) adoption, and (5) the adjustment or adaptation of the system to the innovation (13, p. 21).

The crucial stage as outlined by Hobbs would seem to be the third stage: legitimation. He says:

Although external systems may perform a role by developing and disseminating innovations, the innovations are evaluated and adopted or rejected in terms of the expected consequences for the adopting system. This includes not only what the innovation is purported to accomplish but also what its effect might be on existing patterns of relationships (13, p. 22).

Hobbs then goes on to suggest that support from persons of authority or influence within the system is crucial, and that such support is not likely to be forthcoming if the innovation is perceived by these influentials as threatening to their status (12, p. 22).

Rogers also indicates that influential persons, or opinion leaders, play an important role in the legitimizing of innovations. But he goes further, and suggests that the characteristics of the innovation itself, as perceived by the adopters, have some effect on the speed of its adoption. He lists five such characteristics:

1. Relative advantage -- the degree to which an idea is superior to the one it supersedes.
2. Compatibility -- the degree to which an innovation is consistent with existing values and past experiences of the adopters.
3. Complexity -- the degree to which an innovation is relatively difficult to understand and use.
4. Divisibility -- the degree to which an innovation may be tried on a limited basis.





5. Communicability -- the degree to which the results of an innovation may be diffused to others (22, pp. 124-133).

Hobbs states that the adoption of educational innovations is made difficult because of their characteristics. He says:

Since many educational innovations are complex, they require an appreciable change in orientation, method or knowledge, and skills of the adoptor. (sic) They are difficult to communicate, and their results are difficult to assess. To be implemented successfully, many require major system changes (13, pp. 23-24).

A further reason for the schools' slowness in accepting change is that one of the purposes of the school is perceived by teachers and by the public alike to be to maintain existing societal patterns (13, p. 23). Eboch states that "... the school is a conservative social institution, and change must develop naturally and slowly in the interests of 'conserving' the values and purposes for which it was designed" (8, p. 34). To ensure that schools do, in fact, conserve societal values, local governments and state departments frequently develop restrictive laws, regulations, and traditions which leave little room for innovation (14, p. 51).

All of the above would seem to suggest that it is unlikely that schools can hope to keep pace with innovative developments in society at large. It has been suggested that schools educate people for a world which no longer exists and that this pattern can only be broken if teachers, administrators, and school boards can agree that changes in education are desirable, "... acknowledging that many they set out to introduce will probably cause them anxiety" (29, pp. 18-19).

If change is indeed desirable, who is in the best position to initiate change and introduce innovations in education? Wayland



believes that

. . . successful innovations are more likely to be achieved when initiated by administrative officials, not only because of the power of their office, but also because they are in a position to handle the system problems inevitably associated with innovation in an on-going system (28, pp. 612-613).

Ribble disagrees with the above view. He suggests that there are basically two views with respect to innovation: the administrative view depicted in Figure 3 and the classroom view depicted in Figure 4. He describes the two views in the following words:

What I will call the "administrative view," although not all administrators share it, places the expertise about curriculum innovation with the instructional leaders. This view does not allow power decisions to be made by the teachers or students. They are at the bottom of the power structure when it comes to the introduction of curriculum changes. The real decisions on curriculum changes are made by the board of education, the superintendent, the curriculum specialists, etc., . . .

What I will call the "classroom view" . . . assumes that knowledge and understanding of curriculum are held by teachers and students. The distribution of decision-making power is a reversal from the administrative view . . . The teacher and student are now at the top of the power structure with their roles determining the curriculum innovations (21, p. 43).

Ribble believes that the reason for the professional teacher's resistance to innovation is based on the attitudes adopted by those who share the "administrative view." He says that the professional teacher cannot understand the authorities who ". . . state the rules for being a good teacher in professional terms but who, in practice, define the good teacher as a compliant technician" (21, p. 44).

Although not all writers would take the extreme position adopted by Ribble, many would support him to some extent. Guest, for example, states that





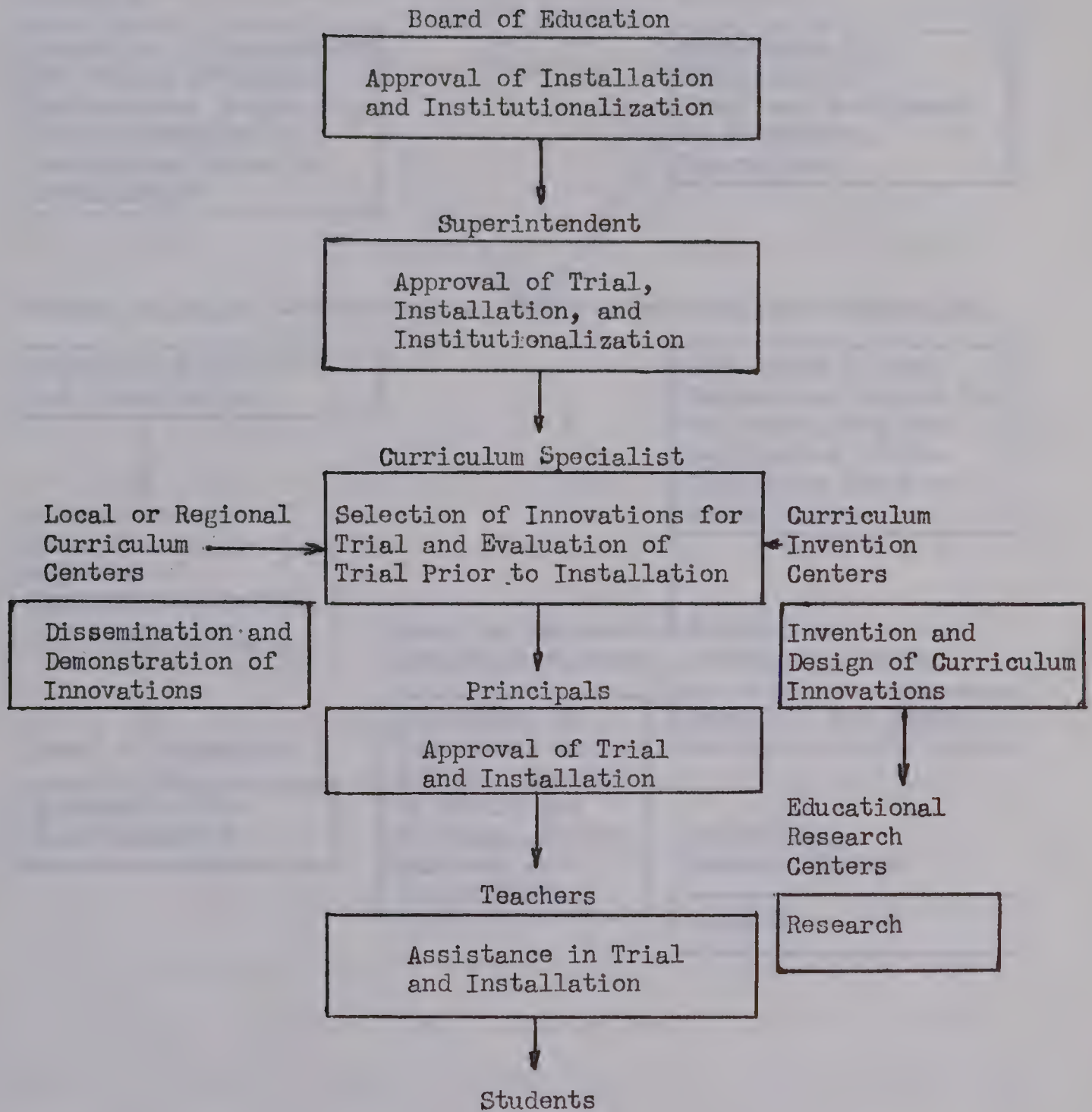


FIGURE 3

ADMINISTRATIVE VIEW (RIBBLE)





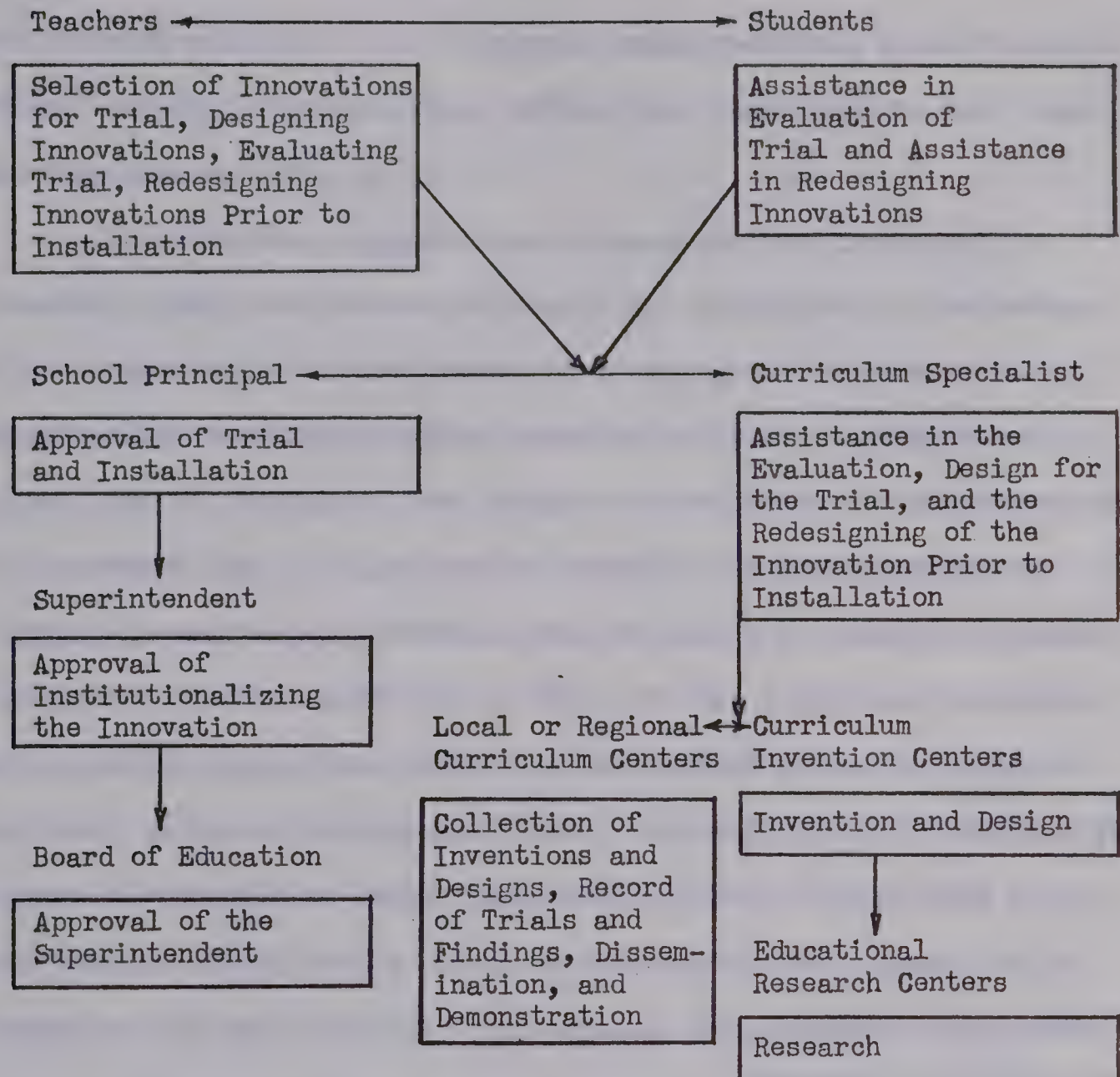


FIGURE 4  
CLASSROOM VIEW (RIBBLE)



. . . controls imposed by persons at the top of the hierarchy do not assure either efficiency or the co-operation of the subordinates. There must be some kind of involvement from below which makes it possible for subordinates to accept changes and even to initiate a certain amount of change themselves (11, p. 153).

And Lanzetta says that ". . . informal problem-solving should be widespread through the organization, rather than restricted to the formal planning session" (15, p. 31).

The foregoing suggests that persons who are interested in promoting change and innovation should try to involve all the members of the organization to some extent in planning and experimentation, occasionally even without prior consultation with the administration. Rogers goes on to suggest that enough is known about the characteristics of innovators that it might even be possible for administrators to surround themselves with teachers who are likely to develop an innovative climate on the staff (22, p. 256). He has found that innovators are generally young, have relatively high social status in terms of education, prestige ratings and income, and tend to rely on cosmopolite sources of information rather than local sources. But he also warns that they are likely to be viewed as deviants by their peers and by themselves (22, pp. 253-254). In addition, Pelz suggests that staff turn-over is sometimes desirable just to ensure that persons with new ideas will occasionally be brought into the group. He has found that as research groups stay together beyond four or five years, they become progressively less productive (19, p. 33).

Whether or not the "administrative view" decried by Ribble is the desirable view to take with respect to innovation, most of the recent research seems to assume that the administrator is, in fact, the key





person in the process of change. Probably the most extensive work in recent years has been undertaken by Carlson, who has found that school superintendents are more likely to attempt innovation when they are new to a district than if they have been appointed from within the district. In fact, he has found that innovative superintendents are more mobile; they tend to move from one district to another, improving their position each time they move. He calls them "career-bound" as opposed to the "place-bound" superintendents who are content to remain in one place and to maintain the status quo (5). In another study Carlson found that when innovators were compared with non-innovators, the non-innovators tended to (1) have less formal education, (2) receive fewer friendship choices, (3) know well fewer of their peers and be less well known by them, (4) participate in fewer professional meetings, (5) interact less often with other superintendents in their area, (6) be sought less often for advice and information, (7) receive lower ratings on professionalism scales, (8) hold less prestigious superintendencies, (9) perceive less support from their school boards, and (10) rely more on local sources for advice and information (4, p. 64).

What is true at the level of the superintendent appears also to be true at the level of the principal. In an Alberta study, Rappel found that there was significantly more change in schools in which the recently-appointed principal came from outside the school rather than from the ranks of the teachers within the school (20).

Another recent study which focuses on the administrator was conducted by Marion who was following Rogers' suggestion that innovativeness is associated with personal variables such as anxiety,





values, dogmatism, mental rigidity, professionalism, cosmopolitanism, opinion leadership, and education. In addition Marion investigated the innovativeness of the principal as related to social system norms on innovativeness. He summarizes his findings as follows:

It can be concluded from this study that the innovative principal . . . tends to be younger than his fellow principals, to be cosmopolite, more professionally oriented, to be influential among his fellow principals, to be mentally flexible, to be viewed as highly innovative by other principals and to have recently taken university courses. The innovative principal usually works in a school situated in a higher socio-economic area of the community, staffed by teachers who favor the adoption of new educational practices. The amount of education of the principal, his dogmatism, anxiety, his values and the size of the school seem to bear no relationship to his innovativeness (17, p. v).

There have been few studies which focus on the role of the teacher in the process of change. Those which do seem to point to the importance of the relationship which exists between the teachers and their principals. Thus Chesler, Schmuck and Lippitt found that ". . . principals with innovative staffs were found to be in tune with their teachers' feelings and values about education and better informed about their informal relationships" (6, p. 275). This finding would seem to indicate that more attention should be paid in future research to the internal dynamics of the school as a social system, and in particular to the attitudes and values of the teachers.

While some studies have, in fact, attempted to assess the attitudes of teachers on a variety of subjects, there do not appear to be any which have dealt adequately with the attitudes toward change held by teachers. In the present study, of course, attitudes play an important part. It is therefore necessary to devote some space to a discussion of this concept and to review some of the literature which



deals with it. This will be done in the next section.

## II. ATTITUDES AND ATTITUDE CHANGE

### Definitions

In Chapter I an attitude was defined as ". . . a relatively permanent disposition to evaluate some entity negatively or positively" (18, p. 453). This definition is quite representative of those given by the various scholars who have been concerned with this concept. Various refinements have been added for particular purposes from time to time, of course. For example, it has been suggested that attitudes may cluster and form constellations of related attitudes. These are referred to as values (25, p. 99). It has also been suggested that attitudes may be distinguished from opinions and beliefs, the latter being based on what the person considers to be facts about which he may have no emotional reactions, while the former always involve some feeling or emotion (25, p. 98).

### Components of attitudes

Rosenberg and Hovland suggest that attitudes contain three components: the affective, the cognitive, and the behavioral components (23, p. 1). The affective component is always present if an attitude is defined in terms of positive or negative evaluation of an object. Similarly, the cognitive component must always be present, for it would seem to be impossible to have an attitude about an object concerning which one does not have at least a minimum of knowledge. The behavioral component may or may not be present. A person may hold an attitude, even quite strongly, and yet fail to act in accordance with





this attitude. Thus LaPiere found that 90 per cent of a sample of restaurant, hotel and cafe owners indicated that they would not accept members of the Chinese race as guests in their establishments, but only one out of sixty-six actually acted in accordance with his expressed attitude (26, pp. 250-251).

It must be remembered, also, that an attitude is an inferred variable. It is not directly observable, but is inferred on the basis of other variables which are measurable. Rosenberg suggests that the measurable variables are the stimuli which elicit action on the part of the subject, and the actions themselves. For each of the components of an attitude Rosenberg suggests that there are appropriate measures (see Figure 5). The affective component is assessed by measuring the sympathetic nervous responses of the individual and by simply asking him how he feels about the object in question. The cognitive component is assessed on the basis of the subject's perceptual responses and by his statements of his beliefs. And the behavioral component is measured by observing the person's overt actions and by asking him to state what he would do in certain circumstances (23, p. 3).

### Attitude Change

Considerable research effort has gone into the problem of attitude change, and although important findings have been reported, it is very difficult to make any generalizations which make accurate prediction possible. Cohen reports, for example, that one-sided arguments result in more attitude change with less educated people, while two-sided arguments are more effective with well educated persons (7, p. 3). In some cases, stating a conclusion after a presentation is





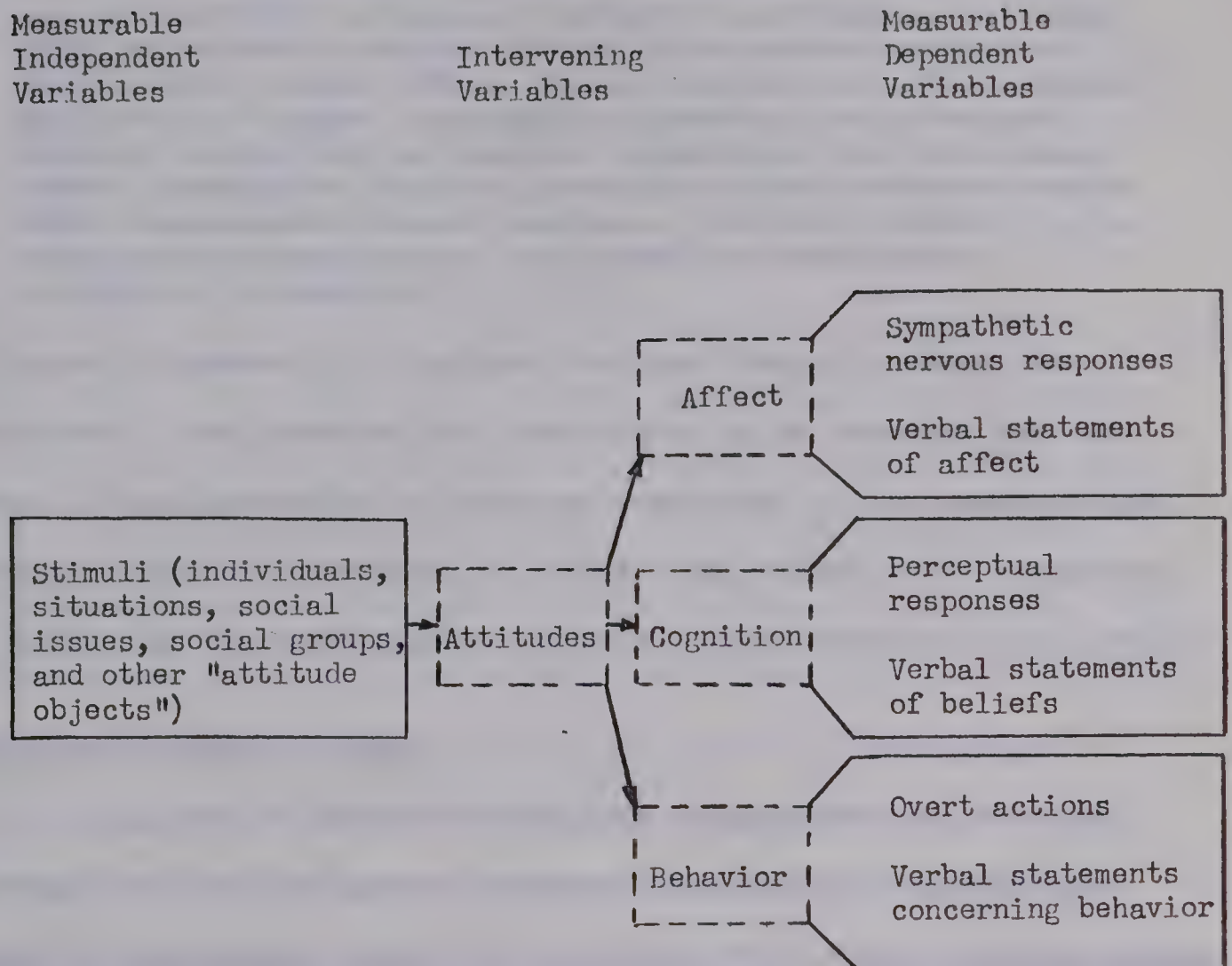


FIGURE 5

COMPONENTS OF AN ATTITUDE (ROSENBERG AND HOVLAND)



desirable; in others it is not (7, pp.6-8). Nor are the findings with respect to primacy conclusive. Cohen states:

The findings regarding primacy and recency... seem to rule out any universal principle of primacy in persuasion, but they have led to specifications of some of the sets of conditions which affect primacy. These factors include time of measurement, similarity of issues, contiguity of presentation, number of separate issues, earlier positive experiences with the communicator, interpolated activity, warnings against premature commitment, encouragement toward commitment, ambiguity inherent in the sequence of communications, and arousal of needs before proffering information (7, p. 15).

In general, members of an audience are more likely to change their attitudes if they perceive the communicator to be credible, but the basis of this perception is sometimes irrelevant to the communication. Whether a person is perceived as credible may depend on his appearance as well as on his more pertinent personal characteristics (7, pp. 28-29).

### Theories of Attitude Change

A number of theories of attitude change have been advanced. Although each has its special emphasis, they are all concerned with cognitive consistency within the individual (7, p. 62). In this respect they are in agreement with the idea based on systems theory that systems always tend toward the steady state. Cohen puts it this way:

Psychological structure is composed of an integrated, organized set of cognitions regarding some object or event. The introduction of new information aimed at changing attitudes disrupts that organization and produces disequilibrium. The problem, then, is to understand just how an adjustment is made so that equilibrium is again achieved (7, p. 62).

Three cognitive models of attitude change have been developed. One is the congruity model proposed by Osgood and his associates, another is Heider's balance model, and the third is Festinger's theory of cognitive dissonance. No attempt will be made here to explain any





of these in detail, but the main features of each will be mentioned.

The congruity theory asserts that attitudes may be placed on a scale such as the one shown in Figure 6. The condition of disequilibrium arises when objects on opposite ends of the continuum are perceived as forming a positive relationship with one another. Thus, if President Johnson were to develop a permanent and warm friendship with Premier Kosygin, this would be incongruent, and the person who holds the attitudes as shown would be faced with a dilemma. A number of solutions are possible. For example, the observer might argue that the apparent friendship between the two leaders is not what it seems, that in fact the two men still dislike one another. But if this rationalization were impossible due to overwhelming evidence that the two leaders had, in fact, become friends, the congruity model states that the subject would either change his attitude toward Johnson or toward Kosygin (3, pp. 15-23). "If the existence of incongruity results in pressure to reduce it, the process is one of attitude change" (7, p. 66).

More specific predictions may be made from the congruity model. If, for example, the person toward whom the subject is highly negatively oriented, say Premier Kosygin, were to make a favorable statement about one toward whom the subject is only slightly negatively disposed, say President de Gaulle, the change in attitude would be to make the subject's attitude toward de Gaulle more negative than ever, rather than to move Premier Kosygin in a positive direction. Cohen states that, according to this theory, ". . . attitude change is inversely proportional to the extremity or polarization of the attitude on the good-bad scale" (7, p. 68).





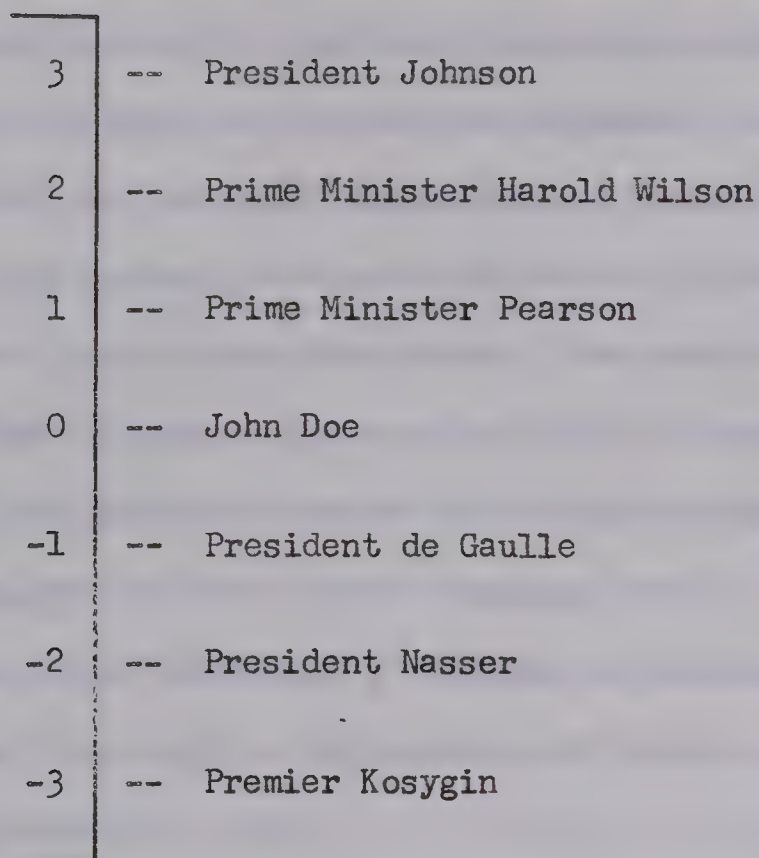


FIGURE 6  
CONGRUITY SCALE



The basic postulate of the balance model is that ". . . if people seek balance or congruence between their beliefs and their feelings about objects, then their attitudes can be changed by modifying either the beliefs or the feelings" (7, p. 69). In an experiment designed to test this postulate, Rosenberg hypnotized subjects who had expressed a dislike for Negroes, and who had expressed the belief that property values would be lowered if Negroes were allowed into white neighborhoods. Under hypnosis, the subjects were told that they would feel friendly toward Negroes when they awoke. The results of the experiment showed that these subjects not only felt friendly toward Negroes, but that they had also changed their beliefs with respect to the lowering of property values. Cohen concludes that ". . . when the affective component of an individual's attitude is altered, there occurs a corresponding and consistent reorganization of beliefs about the objects of that affect" (7, p. 71).

Festinger's cognitive dissonance theory is similar to the others, but it suggests as well that psychological tension has drive characteristics. It may therefore be thought of as a theory of motivation as well as one which is concerned with attitude change.

Festinger states that

. . . dissonance, that is, the existence of nonfitting relations among cognitions, is a motivating factor in its own right . . . . Cognitive dissonance can be seen as an antecedent condition which leads to activity oriented toward dissonance reduction just as hunger leads to activity oriented toward hunger reduction. (9, p. 3).

Festinger suggests that dissonance arises when new events or information disagree with existing knowledge, opinion or cognition concerning behavior. Dissonance also arises when a person engages in





behavior which contradicts his opinions regarding the desirability of that behavior. The dissonance can be reduced by changing either the cognition or the behavior. If it is impossible to change the behavior, or if such a change is made difficult by circumstances, there is likely to be a change in the cognitive aspects of the person's attitude. Thus the prisoner of war who is forced to make false confessions will feel dissonance between what he says and what he believes, but the motivating force of the dissonance may well lead him eventually to believe that his confessions may have had an element of truth in them.

A word of warning is in order with respect to the foregoing. It should not be assumed that a person's expressed attitude is always his real attitude. Despite Festinger's suggestion that attitudes will change in order to reduce dissonance between discrepant cognitions, it is possible that certain types of individuals are capable of living with a considerable amount of dissonance. Festinger himself suggests that dissonance will not be as great when the discrepant behavior is seen to be "worth the lie" in view of the rewards such behavior brings with it. And Cohen says that ". . . people can very often accede overtly to the demands of authoritative communicators or to the strictures of their social groups without necessarily undergoing any inner transformation" (7, p. 135).

### The Group Influence on Attitudes

People do not live in isolation from other people. Many of the attitudes held by individuals are developed over a period of time, and frequently these attitudes are similar to the attitudes of others with whom the individual interacts. Schachter, for example, reports that





within each social group in a housing community there was homogeneity of attitudes toward a community-wide problem, but that among these groups there was marked heterogeneity of attitude (24, p. 223).

Cohen reports on an experiment designed by Sherif in which subjects were asked to indicate the range within which they perceived a point of light to be moving on a black field. He comments:

The results show that when an individual who has developed his own range and norm is put into a group with other individuals who have developed their own ranges and norms, the ranges and norms tend to converge. The convergence is not so great, however, as when all of them first work as a group, since individuals have had less opportunity to set up their own stable norms. When as members of a group people face the same unstructured, unstable situation for the first time, they set up a range and standard peculiar to the group, and when they subsequently face the same situation as individuals, they perceive it in terms of the range and standard that they bring from the group (7, p. 108).

A classic experiment by Asch involved the situation in which one naive subject found himself alone in his perception regarding the length of a line. Asch reports that a large proportion of the naive individuals retained their independent judgment throughout the experiment, but that a substantial minority yielded, modifying their judgments in accordance with those of the majority (1, p. 161).

What happens when an individual maintains his independence of judgment in spite of group pressure? Schachter reports that in a controlled experiment, paid participants in a group discussion were directed to play certain roles. Some were expected to adopt the majority point of view, others, the "sliders", were to adopt a minority point of view at first, but then to move gradually to the majority position. Still others were to maintain a minority point of view throughout. The results of the experiment showed that those subjects



who adopted the modal or the slider positions were accepted by the group, while the deviates were rejected as possible future co-workers (24, pp. 223-248).

### Patterns of Social Influence

Not all members of a group have an equal amount of influence in the development of norms. Cohen states that "influence appears to be related to who one is, to what one knows, and to where one is located" (7, p. 118). Menzel and Katz have found that doctors who are influential are more likely to be readers of a large number of professional journals and to value them more highly than doctors of lesser influence (7, p. 119). The same cosmopolitan quality of opinion leaders has been reported by Rogers (22, p. 314). The flow of ideas, and in particular the flow of new ideas, is therefore usually from an outside source of information, through the opinion leaders, to the various members of the group. This process has come to be known as the "two-step flow of communication" (7, p. 214).

### Attitudes, Innovation and Job Satisfaction

The foregoing discussion of attitudes and attitude change has a number of important implications for an understanding of the social processes which are involved when systems are faced with a demand for change and innovation. For example, Rosenberg and Hovland's analysis suggests that a teacher's attitude toward change is made up of the affective, the cognitive and the behavioral components, but that the last of these may not be present in all circumstances. It is possible, for example, that a teacher who favors change nevertheless fails to engage in innovative





behavior. This may occur for a number of reasons, one of which may be that the teacher is under pressure from the other members of the staff who do not favor change. The group studies referred to earlier indicate that such pressures are particularly likely to be effective when they are exerted by certain individuals who for various reasons have become influential members of the staff.

A situation such as the one outlined above may have a number of consequences. Dissonance theory would lead us to expect that a person who is forced to engage in behavior which is not consistent with the other components of his attitude will feel motivated to do something about it in order to reduce the discomforts of dissonance. A number of possibilities might be mentioned. First, the teacher might decide to leave the situation and to seek a position where he is able to act in accordance with his feelings and beliefs. Alternatively, the teacher might decide to remain on the job and to change his attitude to conform to his behavior. Third, he might remain, maintain his original attitude, and live with the discomforts of dissonance. Whichever course he chooses, it is important to remember that as long as the dissonance persists, the teacher is not likely to be particularly satisfied with his job unless there are other factors present in the situation which make the discomforts of dissonance worthwhile.

Other factors related to job satisfaction have been investigated by scholars who were not primarily concerned with theories of attitude change. In general these provide support for the above. March and Simon, for example, list three factors which they say are related to job satisfaction: (1) conformity of job characteristics to self-





characterization, (2) predictability of instrumental relationships on the job, and (3) compatibility of work requirements with the requirements of other roles (16, pp. 94-95). Support for one or more of these points is provided by various writers. Zalesnik, Christensen and Roethlisberger, for example, have used the term "distributive justice" to describe the basis for satisfaction which is derived from the worker's feeling that his job is congruent with his idea of what he should be doing (30, pp. 291-321). When a worker feels that he is not properly matched with his work or with his fellow-workers, he tends to become an isolate, and his job satisfaction drops accordingly (30, pp. 271-272).

Stogdill provides support for the third point made by March and Simon. He says, "Role confusion and role conflict reduce a member's ability to act decisively and reduce his satisfaction with the organization" (27, p. 217).

Change and innovation in an organization place new demands on the persons who occupy the various roles in that organization. In the present study of educational organizations it was hypothesized that these new demands will lead to dissatisfaction if the altered behavior required in the new role is not congruent with the affective and cognitive components of the teacher's attitude. Similarly, it was suggested that a failure to adjust the behavior expected in a role when the teacher feels that a change is necessary will also lead to dissatisfaction. The theoretical arguments outlined above provide support for the hypothesis.

### III. SUMMARY

The literature dealing with theory and research related to the



present study was presented in this chapter. It was pointed out that change and persistence are reciprocals of the same phenomenon in cultural dynamics, and that the opposing forces which favor or oppose change are found in every social setting. The suggestion was made that more research is needed to determine what factors within the school are related to innovativeness.

The importance of attitudes was discussed, and some attention was given to various theories which have sought to explain the process of attitude change. It was suggested that the attitudes of influentials are often of considerable importance in the development of group norms. Finally, dissonance theory was used to point out that dissatisfaction can result when the teacher faces a situation in which he is expected to behave in a manner which is not consistent with the affective and cognitive components of his attitude.





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## CHAPTER IV

### COLLECTION AND TREATMENT OF DATA

In order to test the hypotheses set forth in Chapter II it was necessary to develop a number of questionnaires and to administer these to the teachers in a suitable sample of schools. In this chapter the procedures will be described which were followed in the development and administration of these instruments. Some general information will be provided with respect to the respondents, their characteristics and their responses on the various questionnaires. In the final section the methods used in the testing of the hypotheses will be described.

#### I. COLLECTION OF DATA

##### The Sample

The superintendents or assistant superintendents of schools of four large city school districts were contacted for permission to collect data in schools enrolling grades one to nine and having a staff of at least twelve teachers. Three of these granted the requested permission, while the fourth declined to participate due to previously made research agreements with the graduate faculties of another university.

In the three cooperating districts there were fifty-three schools which were eligible for inclusion in the study. These were contacted by letter, and a follow-up telephone call or personal visit was made to secure as large a sample as possible. Due to the nature of the study it was pointed out that staff participation was essential, and that total participation was highly desirable. In view of this requirement, as well





as because of the fact that the study was conducted after a number of other students had already visited some of the schools with research projects of their own, it was possible to secure the co-operation of only thirty-six of the schools in the potential sample. The smallest school included in the study had a staff of twelve, while the largest had a staff of thirty-three, including the principal. The numbers of schools of various sizes are shown in Table II.

Twenty-one of the thirty-six schools surveyed returned all of the questionnaires. Five more had only one missing respondent, three had two missing, one had three missing, and three others had four missing. On the assumption that the missing respondents were not different from the others in any systematic way, the foregoing schools were used in the analysis of the data. Three other schools, not listed above, were not used in the analysis because there were more than four missing respondents in each case. In the schools which were used in the analysis, 96.4% of the teachers returned completed questionnaires.

TABLE II

## NUMBERS AND PERCENTAGES OF SCHOOLS BY SIZE OF SCHOOL

Number of Teachers on Staff (including Principal)	Number of Schools					Per Cent of Total Number
	District	A	B	C	Total	
12-15		6	0	0	6	18.18
16-20		6	1	1	8	24.24
21-25		5	1	1	7	21.21
26-30		2	2	4	8	24.24
31-33		2	1	1	4	12.12
Total		21	5	7	33	99.99



### Data Collection

In each of the cooperating schools, the names of the teachers were placed on coded lists, with an identification number assigned to each teacher. In the majority of cases these coded lists were prepared by the researcher, but in several cases they were prepared by a member of the staff. By means of this coding the analysis was not only simplified, but the respondents were assured of a greater measure of anonymity than would otherwise have been possible.

The questionnaires were placed in envelopes and delivered to the schools by the researcher personally. The principal or a member of the staff then distributed them, and asked the teachers to return the completed questionnaires to the office in sealed, unmarked envelopes which were provided for this purpose. After several days, the researcher returned to pick up the completed questionnaires from the school office.

### Characteristics of Respondents

Tables III to VIII provide information with respect to some of the personal characteristics of the respondents.

As might be expected, Table III indicates that the majority of the principals in the sample are males, while the majority of the teachers serving in the schools are females.

The average principal is 48.87 years of age, while the average teacher is 35.68 years old.

Table V indicates that approximately sixty per cent of the respondents in this sample were married, the proportions being almost identical for principals and teachers.

An examination of Table VI reveals that the majority of the





TABLE III  
DISTRIBUTION OF PRINCIPALS AND TEACHERS BY SEX

Sex	Principals		Teachers		Total	
	No.	Per Cent	No.	Per Cent	No.	Per Cent
Male	23	69.70	193	29.07	216	30.99
Female	10	30.30	454	68.37	464	66.57
Not Stated	nil	nil	17	2.56	17	2.44
Total	33	100.00	664	100.00	697	100.00

TABLE IV  
DISTRIBUTION OF PRINCIPALS AND TEACHERS BY AGE

Age	Principals		Teachers		Total	
	No.	Per Cent	No.	Per Cent	No.	Per Cent
60+	7	21.21	35	5.27	42	6.03
50 - 59	7	21.21	71	10.69	78	11.19
40 - 49	11	33.33	91	13.70	102	14.63
30 - 39	7	21.21	107	16.11	114	16.36
Under 30	nil	nil	310	46.69	310	44.47
Not Stated	1	3.03	50	7.55	51	7.32
Total	33	99.99	664	100.01	697	100.00





TABLE V  
DISTRIBUTION OF PRINCIPALS AND TEACHERS BY MARITAL STATUS

Marital Status	Principals		Teachers		Total	
	No.	Per Cent	No.	Per Cent	No.	Per Cent
Single	10	30.30	198	29.82	208	29.84
Married	20	60.60	407	61.30	427	61.26
Divorced	1	3.03	15	2.26	16	2.30
Widowed	1	3.03	23	3.46	24	3.44
Not Stated	1	3.03	21	3.16	22	3.16
Total	33	99.99	664	100.00	698	100.00

TABLE VI  
DISTRIBUTION OF PRINCIPALS AND TEACHERS BY EDUCATION

Years of Education	Principals		Teachers		Total	
	No.	Per Cent	No.	Per Cent	No.	Per Cent
6 or more	19	57.58	9	1.36	28	4.02
5	10	30.30	63	9.49	73	10.47
4	2	6.06	186	28.01	188	26.97
3	nil	nil	104	15.66	104	14.92
2	nil	nil	144	21.69	144	20.66
1	nil	nil	94	14.16	94	13.49
Not Stated	2	6.06	64	9.64	66	9.47
Total	33	100.00	664	100.01	697	100.00



principals in the sample had at least six years of education beyond grade twelve, but only 1.36 per cent of the teachers had this amount of education. The average teacher, in fact, had only three years of education recognized for salary purposes in the Province of Alberta. This is less than the lowest amount of education obtained by any of the principals in the sample.

Tables VII and VIII give the number of years of experience of the teachers and principals, respectively. The average teacher has served in his present school for just over one year. The data for this study were collected during February and March, and the respondents were instructed to count their present year as a full year. Thus it can be seen that 41.42 per cent of the teachers had not yet completed their first year on the staff of their present schools. In addition, it is noted that the average teacher is in his seventh year of teaching. This indicates that the majority of the teachers who are new to their schools are not necessarily new to teaching.

Of the thirty-three principals, seven were new to this post in their present schools. One of these had not been a principal before. Three principals indicated that they had been on the teaching staff of their present schools before assuming the principalship. The average principal had held a principalship in some school for 12.33 years and had been principal of his present school for five years.

## II. INSTRUMENTATION

In this section the instruments which were used in the collection of data will be described. The actual instruments are shown in Appendix A.





TABLE VII  
DISTRIBUTION OF TEACHERS BY YEARS OF EXPERIENCE

No. of Years	Present School		Total Teaching	
	No.	Per Cent	No.	Per Cent
50 - 59	)		5	0.75
40 - 49	)		9	1.36
30 - 39	) 54	8.12	25	3.77
20 - 29	)		64	9.64
10 - 19	)		133	20.03
9	14	2.11	29	4.37
8	12	1.81	29	4.37
7	16	2.41	33	4.97
6	19	2.86	45	6.78
5	24	3.61	39	5.87
4	37	5.57	44	6.63
3	76	11.45	49	7.38
2	117	17.62	63	9.49
1	275	41.42	75	11.30
Not Stated	20	3.01	22	3.31
Totals	664	99.99	664	100.02





TABLE VIII  
DISTRIBUTION OF PRINCIPALS BY ADMINISTRATIVE EXPERIENCE

No. of Years	Principal of Present School		Total Years as Principal	
	No.	Per Cent	No.	Per Cent
26 - 30	nil	nil	1	3.03
21 - 25	1	3.03	3	9.09
16 - 20	2	6.06	10	30.30
11 - 15	4	12.12	3	9.09
6 - 10	7	21.21	8	24.24
5	3	9.09	1	3.03
4	4	12.12	2	6.06
3	1	3.03	1	3.03
2	4	12.12	3	9.09
1	7	21.21	1	3.03
Totals	33	99.99	33	99.99



### Teacher Opinion Questionnaire

The Teacher Opinion Questionnaire was developed for the purpose of assessing the attitudes toward change held by the teachers in the sample. No suitable instrument of demonstrated reliability and validity was available, and so it was decided to construct a questionnaire specifically for the present study. A Likert-type questionnaire consisting of sixteen items was developed and tested for reliability in a pilot study using seventy-three teachers from the five largest schools in a medium-sized district. The coefficient of internal consistency based on the split-half technique was .866, while the coefficient of stability based on the test-retest method was .805. The item-total score correlations for the sixteen items on the questionnaire are shown in Table IX.

Two estimates of validity were obtained for the Teacher Opinion Questionnaire, one at the time of the pilot study and another during the main study. The principals of the five schools used in the pilot study were asked to rate their teachers on a five-point scale on the basis of their acceptance of change. (See Appendix B for the criteria used by the raters for this purpose.) Ratings were also obtained from the assistant superintendent in the district. The two sets of ratings were pooled and the resulting rating for each teacher was correlated with his score on the Teacher Opinion Questionnaire. The result was a correlation of .455.

A further check on the predictive or concurrent validity of the Teacher Opinion Questionnaire was calculated from the data obtained in the main study. The thirty-three principals involved in the main study responded to the Teacher Opinion Questionnaire and to another entitled Principal Opinion Questionnaire. (See Appendix A.) The latter consisted





TABLE IX  
ITEM-TOTAL SCORE CORRELATIONS FOR  
TEACHER OPINION QUESTIONNAIRE  
(N = 73)

Item No.	Correlation with Total	p (2-tailed)
1	0.559	.001
2	0.436	.001
3	0.421	.001
4	0.612	.001
5	0.460	.001
6	0.436	.001
7	0.623	.001
8	0.538	.001
9	0.352	.01
10	0.610	.001
11	0.360	.01
12	0.569	.001
13	0.447	.001
14	0.566	.001
15	0.429	.001
16	0.386	.01





of questions relating to the usefulness of various innovations. The correlation between the Principal Opinion Questionnaire and the Teacher Opinion Questionnaire was .541.

### The Teacher Practices Questionnaire

The Teacher Practices Questionnaire was developed for the purpose of assessing innovativeness in schools. An innovation has been defined in Chapter I as a practice which is relatively new to a person or a system, and innovativeness was defined as the tendency to adopt or to experiment with innovations. This definition assumes that persons or systems which are innovative in one area will be likely to be innovative in others as well. It follows that the individual items chosen for inclusion on a scale of innovativeness should correlate reasonably well with one another and with the total score when all of them are summed. The ten innovations chosen for the present scale meet this requirement, as may be seen from Table X.

It may be argued that the instrument should contain other innovations in addition to the ones included. The present items were chosen, however, because they were all available to each of the schools in the three districts surveyed.

The Teacher Practices Questionnaire, which is included with the others in Appendix A, will be discussed further in a later section. It should probably be noted here, however, that this questionnaire was completed by the teachers in the sample, but not by the principals, because some of the items were not applicable to the principals, particularly if they were non-teaching principals.



TABLE X  
ITEM-TOTAL SCORE CORRELATIONS FOR TEACHER PRACTICES QUESTIONNAIRE  
(N = 659)

Item No.	Correlation with Total	p (2-tailed)
1	0.339	.001
2	0.413	.001
3	0.373	.001
4	0.575	.001
5	0.590	.001
6	0.353	.001
7	0.356	.001
8	0.407	.001
9	0.460	.001
10	0.640	.001

### Interaction Questionnaire

Interaction was determined by means of the sociometric instrument entitled "Interaction Questionnaire." (See Appendix A).

The Communications Dimension. In order to obtain information regarding the communications networks in any particular school, each of the members of the school staff was asked to indicate with whom he was likely to discuss school matters during the course of a typical school week. To validate the responses, it was decided to make certain that claimed communications were reciprocated. For example, if X indicated that he communicates with Y, the communication was considered valid only if Y also indicated that he communicates with X. Blocker et al cite several authorities who suggest that the use of reciprocated choices adds validity to sociometric data (2, p. 25).

The reciprocated choices were recorded in a matrix in which each





member was represented by a row and a column. Those choices made by X which are reciprocated appear in Row X, and the reciprocated choices made to X appear in Column X. The result is a symmetrical matrix, in which the communication links are revealed by an examination of either the rows or the columns. The communications scope of any individual member of the system can then be determined by summing the figures which appear in the appropriate row or column.

The data for the communications dimension were based on the responses to Item I of the Interaction Questionnaire.

The Reliance Dimension. Reliance was measured in the same way as communication, with the exception that reliance links need not be reciprocated to be valid. Blocker et al state:

If X would rely on Y but Y did not reciprocate, this relationship would still exist. For example, if X went to Y for advice and Y offered the requested advice but had no faith in X's judgment and would not solicit or act upon advice from X, a two-way communication link would exist; however, this would be a one-way reliance link (2, p. 29).

Thus reliance links were considered to be uni-directional.

The data for the reliance dimension were based on the responses to Item 2 of the Interaction Questionnaire.

The Attributed Influence Dimension. Attributed influence was measured in the same way as was reliance, but the data were based on the responses to Item 3 of the Interaction Questionnaire.

The Authority Dimension. In this study the principal of the school was considered to be the only individual within the school who is officially and legally recognized as having authority.





### Teacher Satisfaction

Teacher satisfaction was determined on the basis of the responses to the items on the Teacher Satisfaction Questionnaire. This questionnaire was developed at the Midwest Administration Center and subsequently used in an Alberta study by von Fange (6). Data on reliability are not available, but the item-total correlations for each of the six items were computed from the main sample of respondents in the present study. These are shown in Table XI.

TABLE XI  
ITEM-TOTAL SCORE CORRELATIONS FOR THE TEACHER SATISFACTION QUESTIONNAIRE  
(N = 686)

Item No.	Correlation with Total	p (2-tailed)
1	0.613	.001
2	0.525	.001
3	0.500	.001
4	0.426	.001
5	0.263	.001
6	0.429	.001

### Personal Information

In addition to the above, the set of questionnaires given to each teacher and principal contained one entitled "Teacher Background Information Questionnaire." This questionnaire, presented with the others in Appendix A, was included mainly for the purpose of obtaining data with respect to the nature of the sample under study, and in addition proved to be interesting from the point of view of several of the sub-analyses which are dealt with in later chapters.



### III. TREATMENT OF DATA

The data which were collected by means of the instruments described above were used to derive a number of scores suitable for statistical treatment. The manner in which these scores were derived is described in this section. The classification of the respondents for the purposes of the analysis will also be discussed, and descriptive statistics will be provided with respect to attitudes toward change, interaction patterns in schools, and the diffusion of innovations and job satisfaction. Finally, the statistical treatment for each of the hypotheses will be outlined. The actual findings relating to the hypotheses will be discussed at greater length in later chapters.

#### Attitudes Toward Change

Teacher Attitude Score (TAS). Each of the items on the Teacher Opinion Questionnaire was scored from one to five, depending on the response category chosen by the respondent. The TAS was then obtained by summing the scores on the individual items.

School Attitude Score (SAS). The attitudes of the teachers as a group in any one school are referred to as the SAS. This score is the mean of the TAS scores.

Influentials' Attitude Score (IAS). An influential was defined earlier as a person who (1) has validated communication links with at least one quarter of the remainder of the staff, (2) who is relied on for advice by at least one quarter of the remainder of the staff, (3) to whom influence is attributed by at least one quarter of the remainder of the staff, or (4) who is a principal. The IAS for a school is there-





fore the mean TAS score of those persons who have been identified as influentials.

Table XII shows the distribution of attitude scores in the sample. The three means shown in the table are almost identical, which is to be expected in the case of the mean for TAS scores and the mean for SAS scores. The fact that the mean of the IAS scores is only .29 above the mean of the TAS scores is worthy of notice; the attitudes toward change held by the influentials appear to be quite similar to the attitudes of the teachers in general.

TABLE XII

DISTRIBUTION OF TEACHER ATTITUDE SCORES, SCHOOL ATTITUDE SCORES AND INFLUENTIALS' ATTITUDE SCORES

Respondent Category	Unit of Analysis	N	Mean	Standard Deviation
Teachers (TAS)	teacher	694	55.84	7.37
Schools (SAS)	school	33	55.85	2.15
Influentials (IAS)	school	33	56.13	4.45

Variations of the Influentials' Attitude Score. The IAS as described above assumes that the four dimensions used to identify influentials are of equal importance. It was therefore considered advisable to develop a number of alternatives in order to determine whether this assumption was, in fact, valid. The alternatives, which are described below, are summarized for easy reference in Table XIII.





TABLE XIII

SUMMARY OF ABBREVIATIONS USED FOR VARIATIONS OF  
INFLUENTIALS' ATTITUDE SCORES

Abbreviation	Description
IAS - All - P/in	IAS, all dimensions, principal included
IAS - All - P/out	IAS, all dimensions, principal not included
IAS - Com - P/in	IAS, communications dimension, principal included if he qualifies
IAS - Com - P/out	IAS, communications dimension, principal excluded
IAS - Rel - P/in	IAS, reliance dimension, principal included if he qualifies
IAS - Rel - P/out	IAS, reliance dimension, principal excluded
IAS - Attrib - P/in	IAS, attributed influence dimension, principal included if he qualifies
IAS - Attrib - P/out	IAS, attributed influence dimension, principal excluded even if he qualifies
PAS	Principal's Attitude Score (the authority dimension)

The Influentials' Attitude Score as described above will henceforth be referred to as the IAS - All - P/in, which means that it is the IAS using all dimensions, including the attitude score for the principal. The IAS - All - P/out similarly uses all the dimensions with the exception of the authority dimension, and the principal's attitude score is left out even if he qualifies as an influential on one of the dimensions other than the authority dimension. The IAS - Com P/in and the IAS - Com - P/out are based on the attitudes of only those persons who qualify as influentials on the communications dimension; in the case of the first



the principal's score is included if he qualifies on the communications dimension, in the second case his score is not included even if he does qualify. In a similar manner, the IAS - Rel - P/in and the IAS - Rel - P/out refer to the reliance dimension, and the IAS - Attrib - P/in and the IAS - Attrib - P/out refer to the attributed influence dimension. Finally, the Principal's Attitude Score is referred to as the PAS.

### Interaction Patterns in Schools

In Chapter II it was suggested that interaction occurs on the communication, reliance, attributed influence and authority dimensions. The first three of these were specifically used as the basis for a number of hypotheses, and so it was necessary to derive scores based on these dimensions which could be used in the testing of the hypotheses. The manner in which these scores were derived is described below.

School Communication Score (SCS). This score is the proportion obtained by summing the actual validated communication links in a school and dividing by the total number of possible links among the members. Table XIV shows that these proportions ranged from .074 to .487 with a mean of .234.

School Reliance Score (SRS). The SRS is obtained in a manner similar to that described for the SCS above, with the exception that the reliance links do not have to be reciprocated to be valid. The range in proportions is shown in Table XIV to be from .061 to .199 with a mean of .113.

School Attributed Influence Score (SAIS). The School Attributed Influence Score is obtained in the same manner as the SRS, that is, by summing the actual attributed influence links in a school and dividing





by the total number of possible links. In the present sample these proportions ranged from .076 to .212, with a mean of .132 (see Table XIV).

TABLE XIV

MEAN AND RANGES IN SCORES FOR THE SCHOOL COMMUNICATION  
SCORES, THE SCHOOL RELIANCE SCORES AND THE  
ATTRIBUTED INFLUENCE SCORES

Interaction Dimension	Mean	Range
School Communication Score (SCS)	.234	.074 - .487
School Reliance Score (SRS)	.113	.061 - .199
School Attributed Influence Score (SAIS)	.132	.076 - .212

### The Diffusion of Innovations

The innovativeness of the schools in the sample was measured by means of the Teacher Practices Questionnaire (see Appendix A). This questionnaire consists of ten items, each dealing with one activity which was considered innovative in nature. All of these practices were engaged in by some of the teachers, but none had been adopted by all.

All the items except the last were scored from one to four, depending on the amount of use made of the particular practice by the responding teacher. If a teacher failed to respond to one of the items it was scored "one" on the assumption that no use was being made of the innovation.

The last item on the Teacher Practices Questionnaire was scored differently from the others. This item listed five pieces of audio-visual equipment and asked the respondent to check each piece of equipment if he had used it at least twice between September 1, 1966, and





February 1, 1967. The score for this item was therefore the number of items thus checked, with a possible range from zero to five.

The School Innovativeness Score (SIS) was obtained by summing the scores made by the individual teachers on the Teacher Practices Questionnaire, and then dividing by the number of teachers. The principal was not asked to respond to this questionnaire because in many cases he was not involved in classroom teaching.

Table XV shows that School Innovativeness Scores ranged from 15.90 to 22.82 with a mean of 19.00 and a standard deviation of 1.88.

TABLE XV

RANGE, MEAN AND STANDARD DEVIATION FOR  
SCHOOL INNOVATIVENESS SCORES  
(N = 33)

Score	Range	Mean	Standard Deviation
School Innovativeness Score	15.90 - 22.82	19.00	1.88

Tables XVI to XXV provide information with respect to the amount of use made of each innovation.

Television as a Teaching Aid. Table XVI shows how the teachers responded to the question: "How much use do you make of television as a teaching aid?"

Almost half of the teachers in the sample indicated that they made no use whatsoever of television. This finding is interesting in view of the fact that in Marion's study, twenty-nine out of thirty-six principals stated that television was in regular use in their schools



(4, p. 38). In all likelihood, television is not of the same usefulness at all grade levels and for all subjects. It may be that, even though the school's television set is in regular use in most schools, it is being used only by certain people. Examination of the data in the present study indicates that this is the case in many schools.

TABLE XVI  
FREQUENCY OF USE OF TELEVISION AS A TEACHING AID

Response Category	No. of Teachers	Per Cent of Total
(4) use it frequently	35	5.27
(3) use it reasonably often	99	14.91
(2) rarely use it	216	32.53
(1) never use it	308	46.39
( ) unknown	6	0.90
Total	664	100.00

Teacher-Parent Interviews. Table XVII shows how the teachers responded to the question: "How many planned interviews have you had during the teaching day, (that is, while classes would normally be in progress), between September 1, 1966, and December 31, 1966?"

The practice of scheduling teacher-parent interviews involves the administration of the school as well as the teacher because some provision must be made either to dismiss classes early or to provide substitute teachers on interview days. Probably this explains the bimodal distribution of responses. If a school decides to adopt this





practice, it is probably thoroughly organized, making maximum involvement possible. If a school does not decide to organize for such interviews on a large scale, teachers who favour the practice find it possible to make the necessary arrangements with fewer than half of the parents of the pupils in their classes. As in the case of television, nearly half of the teachers reported that they never had such interviews.

TABLE XVII

AMOUNT OF USE OF PLANNED TEACHER-PARENT INTERVIEWS  
DURING THE TEACHING DAY

Response Category	No. of Teachers	Per Cent of Total
(4) have had interviews with most	115	17.32
(3) with about half	62	9.34
(2) with fewer than half	197	29.67
(1) with none	275	41.42
unknown	15	2.26
Total	664	100.01

In Marion's study, fewer than half of the principals reported that their schools made use of this innovation, while three indicated that they had started to conduct such interviews but had decided to discontinue the practice (4, pp. 37-38).

The Use of Consultant Services. Table XVIII shows how the teachers responded to the question which was presented to them as follows:





In many districts the central office appoints consultants, subject supervisors, etc., who are responsible for providing a variety of services for teachers. Although such persons often visit teachers as a matter of routine, they may also make special visits when asked to do so by the teacher. Between September 1, 1966, and February 1, 1967, how many such visits did you ask for?"

TABLE XVIII

NUMBER OF CONSULTANT VISITS REQUESTED BY TEACHERS BETWEEN  
SEPTEMBER 1, 1966 AND FEBRUARY 1, 1967

Response Category	No. of Teachers	Per Cent of Total
(4) three or more visits asked for	32	4.82
(3) two visits asked for	83	12.50
(2) one visit asked for	130	19.58
(1) no visits asked for	415	62.50
unknown	4	0.60
Total	664	100.00

Well over half (62.5%) of the teachers indicated that they never ask for the services of consultants. This may be due to the fact that principals take it upon themselves to invite the consultants into their schools. Marion reports:

This innovation was so widely diffused among the principals in the sample, that the discriminatory power of this innovation is subject to doubt. Only two of the thirty-six principals did not make regular use of consultants (4, p. 37).

Marion goes on to suggest that at least some of the principals make requests for the services of consultants when the teachers indicate that they would welcome such visits. In the present study, of course, the item dealing with consultants correlates .373 with the total innovativeness score, which is significant beyond the .001 level. This,



when considered together with the fact that the practice is not so popular with teachers as with principals, suggests that the use of consultants is an innovation which does have considerable discriminatory power when used in an index of teacher innovativeness rather than in an index of principal innovativeness.

Instructional Services Centres. Tables XIX and XX deal with the use made by teachers of centrally located Instructional Services Centres. These Centres provide materials which are not commonly available in most schools. In addition, the staff of these Centres assist teachers in the development of special materials for particular instructional purposes.

It was decided to ask two questions dealing with Instructional Services Centres, because some teachers make use only of ready-made materials which can be ordered by telephone, while others make actual visits to the Centres to select and develop materials. The questions were therefore worded as follows, and treated as two items:

- Many large school districts operate one or more "Instructional Services Centres" where teachers may obtain assistance with special projects, and from which they may obtain special equipment on loan.
- (a) Between September 1, 1966 and February 1, 1967, how many visits did you make to such a centre?
  - (b) During this time, on how many occasions did you obtain the services of such a centre without a visit to the centre being necessary?

As might be expected, Tables XIX and XX reveal that teachers are more likely to telephone for service than to make actual visits to an Instructional Service Centre. Table XX also shows that teachers tend to use these Centres frequently or not at all.

Observation of Other Teachers. Brickell, in reporting on a study of innovation in New York State, says that





TABLE XIX

NUMBER OF VISITS BY TEACHERS TO INSTRUCTIONAL SERVICES CENTRES  
BETWEEN SEPTEMBER 1, 1966, and FEBRUARY 1, 1967

Response Category	No. of Teachers	Per Cent of Total
(4) three or more visits made	79	11.90
(3) two visits made	65	9.79
(2) one visit made	177	26.66
(1) no visits made	333	50.15
unknown	10	1.51
Total	664	100.01

TABLE XX

AMOUNT OF USE OF INSTRUCTIONAL SERVICE CENTRE SERVICES BY MEANS  
OF TELEPHONED OR WRITTEN REQUESTS

Response Category	No. of Teachers	Per Cent of Total
(4) service used three or more times	217	32.68
(3) service used twice	82	12.35
(2) service used once	83	12.50
(1) service not used this way	266	40.06
unknown	16	2.41
Total	664	99.99





. . . the most persuasive experience a school person can have is to visit a successful new program and to observe it in action. Speeches, literature, research reports and conversations with participants outside the actual instructional setting are interesting but relatively unconvincing (3, p. 27).

While most teachers are unable to travel very far from their schools to observe others at work, it is often possible for inter-visitation to take place within the school. Table XXI shows, however, that 77.41% of the teachers in the present sample have not observed even one of their colleagues in the period from September 1, 1966 to February 1, 1967. It may be that timetables do not allow for such intervisitation, although the fact that some teachers have made such visits makes this doubtful. It is more likely that teachers are uneasy when their colleagues are present, and that they therefore discourage such visits.

TABLE XXI

OBSERVATION OF COLLEAGUES' TEACHING BETWEEN SEPTEMBER 1, 1966,  
AND FEBRUARY 1, 1967

Response Category	No. of Teachers	Per Cent of Total
(4) three or more teachers observed	39	5.87
(3) two teachers observed	31	4.67
(2) one teacher observed	73	10.99
(1) no teachers observed	514	77.41
unknown	7	1.05
Total	664	100.00

Team Teaching. Table XXII shows how the teachers responded to the question: "To what extent are you involved in team teaching?"

Not unexpectedly, this innovation was least widely used in the



thirty-three schools in this sample. In order to organize a school for team teaching on a large scale it is usually necessary to make extensive plant changes, or else to plan a new building for this approach. Probably team teaching is one of the better examples of an innovation in education which has none of the characteristics which Rogers suggests are necessary for speedy diffusion (5, pp. 124-133). In the first place, there is still widespread disagreement concerning the degree to which team teaching is superior to the traditional method. Secondly, team teaching is certainly not consistent with the past experiences of the vast majority of teachers. Third, team teaching is a complex undertaking which requires a great deal of planning both before and during its operation. Fourth, team teaching is perceived by many teachers to be a method which is not divisible; that is, it cannot be tried on a limited basis. This perception may not be entirely accurate, of course. The data of Table XXII indicate, for example, that a number of teachers combine the team teaching approach with more traditional methods. Probably they work in teams for certain subjects and then return to normal routines for other subjects. Finally, the team teaching approach is not easily communicable. In spite of a great deal of publicity given to the approach, the majority of teachers are still not too certain what team teaching is all about. For this reason schools which decide to experiment with team teaching on a large scale find it necessary to undertake extensive in-service training projects well in advance of the date when the school is to begin using the team teaching approach (1, pp. 46-47).

Despite all of the above disadvantages and difficulties, innovative teachers find it possible to use the team teaching approach,





even if only on a limited basis, as is demonstrated by the fact that the scores on this item correlated .356 with total innovativeness scores. This correlation is significant well beyond the .001 level.

TABLE XXII  
AMOUNT OF TEACHING DONE IN TEAMS

Response Category	No. of Teachers	Per Cent of Total
(4) all teaching done in teams	2	0.30
(3) most teaching done in teams	16	2.41
(2) team teaching plays small part	96	14.46
(1) not involved at all	543	81.78
unknown	7	1.05
Total	664	100.00

Experimental Units and Courses. Table XXIII shows how the teachers responded to the question: "In how many of the subjects or classes which you teach are you involved with experimental units or courses of study?"

TABLE XXIII  
NUMBER OF EXPERIMENTAL COURSES OR UNITS TAUGHT

Response Category	No. of Teachers	Per Cent of Total
(4) involved in at least three	20	3.01
(3) involved in two	52	7.83
(2) involved in one	120	18.07
(1) not involved at all	457	68.83
unknown	15	2.26
Total	664	100.00





In the districts in this sample, teachers are permitted to try experimental units and courses, provided they keep the administration informed, and provided they obtain the permission of the administration for unusual experiments. This administrative barrier is not, in fact, a barrier to the innovative teacher, for again the item scores correlated highly with total innovativeness scores ( $r = .407$ ). For the non-innovative teacher, however, the administrative barrier is an excellent justification for maintaining the status quo, for over two-thirds of the teachers stated that they were not involved in any experimental units or courses at all.

In-Service Education. Table XXIV shows how the teachers responded to the question:

"When was the last time that you took part in an in-service education project during the school year?(this refers to projects organized by the ATA, the school district, or by groups of teachers within a school or a group of schools.)

TABLE XXIV

## LATEST PARTICIPATION IN IN-SERVICE PROJECT DURING SCHOOL YEAR

Response Category	No. of Teachers	Per Cent of Total
(4) 1966 - 1967	251	37.80
(3) 1965 - 1966	198	29.82
(2) 1964 - 1965	63	9.49
(1) prior to 1964 - 1965 or never	105	15.81
Unknown	47	7.08
Total	664	100.00



This innovation not only contributed significantly to the total innovativeness score ( $r = .460$ ), but it also was the most popular among teachers. Only 15.81% indicated that they had not attended an in-service training program during the last three years, (although another 7.08% failed to respond to this item.) This finding is interesting in view of the data of Table XXI. While very few teachers are engaged in teaching experimental units or courses, a large number of them are attending in-service training sessions.

The Use of Audio-Visual Equipment. The final item of the Teacher Practices Questionnaire asked the respondents to check those pieces of audio-visual equipment which they had used at least twice between September 1, 1966, and February 1, 1967. The five pieces of equipment listed were: (1) tape recorder, (2) filmstrip or slide projector, (3) movie projector, (4) record player, and (5) the overhead projector. The results are shown in Table XXV.

TABLE XXV

AUDIO-VISUAL EQUIPMENT USED AT LEAST TWICE BETWEEN  
SEPTEMBER 1, 1966, AND FEBRUARY 1, 1967

No. of Pieces of Equipment So Used	No. of Teachers	Per Cent of Total
5	72	10.84
4	100	15.06
3	180	27.11
2	189	28.46
1	85	12.80
0	36	5.42
unknown	2	0.30
Total	664	99.99





This item proved to be the best single indicator of innovativeness, for it correlated .640 with the total innovativeness score.

In spite of the fact that the five pieces of equipment listed have been available for many years, and in spite of the fact that most of them are useful in most subject areas at some time or another, there were thirty-six teachers who stated that they had made no use of any of them during the five months indicated. The mean score for this item was 2.67, and 10.84% of the respondents indicated that they had used all of the pieces of equipment at least twice during the stated time.

### Job Satisfaction

Two satisfaction scores were based on the results obtained from the Teacher Satisfaction Questionnaire (see Appendix A). The Teacher Satisfaction Score (TSS) was simply the sum of the scores on the individual items of the questionnaire. The School Satisfaction Score (SSS) is the sum of the TSS scores of the individual teachers divided by the number of teachers. Table XXVI shows the means for these two scores to be 20.00 and 19.70 respectively.

TABLE XXVI

MEANS AND STANDARD DEVIATIONS FOR TEACHERS AND  
SCHOOLS ON THE TEACHER SATISFACTION QUESTIONNAIRE

Respondent Category	N	Mean	Standard Deviation
Teacher Satisfaction Score (TSS)	686	20.00	5.07
School Satisfaction Score (SSS)	33	19.70	1.90





### Statistical Treatment of Hypotheses

The statistical treatment used in testing the hypotheses included correlational techniques, chi square tests for independence and a two-factor analysis of variance. Additional analysis was based on multiple regression analysis, step-wise regression analysis, and a number of t-tests.

Each of the research hypotheses was restated in the form of a null hypothesis. In the case of the six null hypotheses which are given immediately below, the appropriate Pearson product-moment correlations were computed and the significance of the difference of the correlation from zero was determined. The .05 level with a two-tailed test was required for significance, except in the case of hypothesis 4.1, for which the one-tailed test was appropriate.

Null Hypothesis 1.1. There is no significant correlation between School Attitude Scores and School Innovativeness Scores.

Null Hypothesis 2.1. There is no significant correlation between Influentials' Attitude Scores and School Innovativeness Scores.

Null Hypothesis 3.1. There is no significant correlation between School Communication Scores and School Innovativeness Scores.

Null Hypothesis 3.2. There is no significant correlation between School Reliance Scores and School Innovativeness Scores.

Null Hypothesis 3.3. There is no significant correlation between School Attributed Influence Scores and School Innovativeness Scores.

Null Hypothesis 4.1. There is no significant correlation between School Communication Scores and the similarity of Teacher Attitude Scores within individual schools. (The similarity scores were taken as the





standard deviations for each school of the scores made by the teachers on the Teacher Opinion Questionnaire. A small standard deviation indicated that attitudes were similar, which means that a negative correlation was needed for this null hypothesis to be rejected.)

Null Hypothesis 4.2. This null hypothesis stated: The number of teachers whose TAS scores are different from their school's SAS score and who are isolates in the communications network is equal to the number of teachers whose TAS scores are different from their schools' SAS score but who are not isolates in the communications network.

An individual's TAS score was considered different from his school's SAS score when it was at least two standard deviations above or below the latter. Persons thus identified were divided into two groups: those who were isolates and those who were not isolates. Similarly, the teachers whose TAS scores were within two standard deviations of the SAS were divided into two groups, one composed of isolates and the other of non-isolates. (An isolate was defined as a person who has no validated communication links with any of the other staff members.) The resulting data were entered into a fourfold contingency table and tested for significance by means of the chi square test for independence, using the .05 level as the critical level.

Null Hypothesis 4.3. Null hypothesis 4.3 was worded as follows: The number of teachers whose TAS scores are different from their school's SAS score and who are relied on for advice is equal to the number of teachers whose TAS scores are different from their school's SAS score but who are not relied on for advice.

Differences in attitudes were computed as for hypothesis 4.2, and





then the teachers were further separated into two groups on the basis of the reliance dimension. Those who were relied on for advice by one or more of their colleagues composed one group, while the other group was made up of persons who were not relied on for advice by any other member of the staff. The resulting data were entered into a fourfold contingency table and tested for significance by means of the chi square test for independence, using the .05 level as the critical level.

Null Hypothesis 4.4. This hypothesis stated: The number of teachers whose TAS scores are different from their school's SAS score and to whom influence is attributed by the other members of the staff is equal to the number of teachers whose TAS scores are different from their school's SAS score but to whom influence is not attributed by the other members of the staff.

The data for this hypothesis were derived in a manner similar to that used with hypotheses 4.2 and 4.3 and tested for significance in the same way, using the chi square test for independence and a significance level of .05.

Null Hypothesis 5.1. Null hypothesis 5.1 dealt with satisfaction and was worded as follows: There is no significant difference in satisfaction between teachers whose TAS scores are congruent with their school's SIS scores and those whose TAS scores are not congruent with their school's SIS scores.

In order to test this null hypothesis the teachers in the total sample were first divided into two groups on the basis of their schools' SIS scores. Those who were members of a staff whose SIS was at or above the mean for all schools were placed in one group, while those who were





members of a staff whose SIS was below the mean for all schools were placed in the other group. These groups were then further divided on the basis of the TAS scores of the individual teachers. Those whose TAS was at or above the mean formed one group, while those whose TAS was below the mean formed the other group. The resulting four groups were then used with a two-factor analysis of variance design in which the criterion was the score obtained by the teachers on the Teacher Satisfaction Questionnaire and the two factors used as predictors were the SIS and the TAS. Rejection of the null hypothesis then required an interaction effect significant at the .05 level.

#### IV. SUMMARY

The procedures which were followed in the collection and treatment of data were described in this chapter.

The sample included the teachers in thirty-three schools in three districts. All the schools enrolled grades one to nine, and ranged in size from a staff of twelve to one of thirty-three.

The research instruments which were used in the collection of data included the Teacher Opinion Questionnaire, the Teacher Practices Questionnaire, the Interaction Questionnaire, the Teacher Satisfaction Questionnaire and the Teacher Background Information Questionnaire.

The chapter included a section dealing with the treatment of data, in which the methods of deriving the various scores was described and the statistical design for the analysis of each of the ten null hypotheses was outlined. Basic information with respect to the distribution of scores on the various measures was given. The analysis of the findings relating to each of the hypotheses will be presented in Chapters V, VI and VII.



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## CHAPTER V

### ANALYSIS AND RESULTS: INNOVATIVENESS

The major purpose of this study was to investigate factors related to innovativeness in educational organizations. Five of the hypotheses developed in Chapter II deal specifically with innovativeness. These will be the subject matter for the present chapter.

#### I. ANALYSIS OF SUB-PROBLEM I

The first sub-problem was stated in the form of the following question: "Is innovativeness in schools related to the attitudes with respect to change held by the teachers in the school?" On the basis of the theoretical considerations presented in Chapter II Hypothesis 1.1 was formulated. The findings relating to this hypothesis are discussed below.

Hypothesis 1.1 -- The amount of innovation which takes place in a school is related to the attitudes toward change held by the teachers in the school.

Findings. The Pearson product-moment correlation coefficient between the School Innovativeness Score and the School Attitude Score was .314, as may be seen by reference to Table XXVII. Using a two-tailed test, this correlation is below the level required for significance. The research hypothesis is not supported by this analysis, and if the two-tailed test is accepted as appropriate, it must be concluded that the present data do not support the hypothesis that the amount of innovation which takes place in a school is related to the attitudes toward change





held by the teachers in the school.

TABLE XXVII

CORRELATIONS BETWEEN ATTITUDES TOWARD CHANGE AND INNOVATIVENESS  
AT THE SCHOOL AND AT THE INDIVIDUAL LEVEL

Variables Correlated	Level of Analysis	N	r	p (1-tailed)	p (2-tailed)
School Attitude Scores and School Innovativeness	school	33	.314	.05	N.S.
Teacher Attitude Scores and Teacher Innovativeness	individual	602	.152	.0005	.001

Further Analysis. Hypothesis 1.1 dealt with the attitudes of teachers and the amount of innovation at the school level. When the Pearson product-moment correlation coefficient was computed between teachers' individual attitudes and individual innovativeness the result was a coefficient of .152. Table XXVII shows that this correlation is significant at the .0005 level for a one-tailed test, and at the .001 level for a two-tailed test.

Discussion. Although hypothesis 1.1 was not supported when a two-tailed test was used, Table XXVII shows that a one-tailed test would result in a decision to accept the hypothesis. It might be argued that a one-tailed test is appropriate in view of the theoretical reasoning which led to the hypothesis. Even if this position is taken, however, it should be noted that the correlation is not high enough to account for more than 10 per cent of the variance in innovativeness. When the



individual level is considered it can be seen that only a little more than two per cent of the variance in innovativeness can be accounted for by the variance in the teachers' attitudes.

## II. ANALYSIS OF SUB-PROBLEM II

The second sub-problem was stated thus: "Is innovativeness in schools related to the attitudes with respect to change held by the influentials in the school?" The hypothesis which followed is considered below.

Hypothesis 2.1 -- The amount of innovation which takes place in a school is related to the attitudes toward change held by the influentials in the school.

Findings. Table XXVIII shows that the Pearson product-moment correlation coefficient between the SIS and the IAS - All-P/in was .512, which is significant at the .01 level using a two-tailed test. The research hypothesis is therefore accepted. The amount of innovation which takes place in a school is related to the attitudes toward change held by the influentials in the school.

Further Analysis. Hypothesis 2.1 was tested using the definition of influentials as originally given in Chapter I. The alternative definitions mentioned in Chapter IV were also used as correlates of innovativeness. The results are shown in Table XXVIII.

Discussion. From Table XXVIII it may be seen that the best predictor of a school's innovativeness is the IAS - All-P/out, which accounts for 35.52 per cent of the variance in innovativeness in the schools in this sample. The IAS - All-P/out is the average score made





on the Teacher Opinion Questionnaire by the influentials from all dimensions combined except for the authority dimension. The principal's score was not used even if he qualified as an influential on one of the dimensions of communication, reliance or attributed influence. In addition Table XXVIII shows that the correlation between the Principal's Attitude Score and the School Innovativeness Score is only .218, which is not statistically significant.

TABLE XXVIII

CORRELATIONS BETWEEN THE ATTITUDES TOWARD CHANGE HELD BY  
INFLUENTIALS AND INNOVATIVENESS IN THE SCHOOL  
(N = 33)

Variations of Influential Groupings	Correlation Between School Innovativeness and Attitudes of Influentials	p (1-tailed)	p (2-tailed)
IAS - All - P/in	.512	.005	.01
IAS - All - P/out	.596	.0005	.01
IAS - Com - P/in	.236	N.S.	N.S.
IAS - Com - P/out	.230	N.S.	N.S.
IAS - Rel - P/in	.365	.05	.05
IAS - Rel - P/out	.558	.0005	.01
IAS - Attrib - P/in	.506	.005	.01
IAS - Attrib - P/out	.571	.0005	.01
PAS ( Principal only)	.218	N.S.	N.S.

In spite of the fact that the attitude of the principal is not significantly related to innovativeness, the teachers in the present sample indicate that they consider the principal to be an influential, and that they rely on him for advice. Table XXIX shows the number of times that the principal qualified as an influential on each of the dimensions other than the authority dimension, using the criteria





established in Chapter I.

TABLE XXIX  
THE PRINCIPAL AS AN INFLUENTIAL IN 33 SCHOOLS

Dimension	No. of Times Principal Qualifies	%
Communication	15	45.45
Reliance	33	100.00
Attributed Influence	33	100.00
All Dimensions	15	45.45

Although the best predictor of innovativeness is obtained when combining the communications, reliance, and attributed influence dimensions, it is noteworthy that the best single dimension is the attributed influence dimension. This dimension is not based on direct interaction among teachers, but on the teachers' perception that a colleague is influential. Apparently teachers are good judges of each others' ability to exert influence, and it would seem that they pattern their actions after the manner of those whom they consider to be influential. The exception, of course, is the principal. Although teachers state that the principal is influential, and that they rely on him for advice, they do not appear to be influenced by his attitudes toward change. It is not unlikely, of course, that teachers nominate the principal for the reliance and attributed influence dimensions because they feel they ought to in view of the latter's formal position.

It should be noted that the communications dimension is not very important in terms of influence. Possibly this is true in particular



for innovation, because communication among teachers probably deals with many aspects of education, while advice is probably sought more about matters with which a teacher is unfamiliar. A teacher does not need advice about that with which he is familiar, but on new or innovative practices he will go for advice to those whom he considers to be expert, even though these experts are not necessarily the ones who have the most to say in general discussions around the staffroom.

Table XXX shows that there is a fairly high negative correlation between innovativeness and the average age of the teachers on the staff. Also there is a fairly high negative correlation between innovativeness and the proportion of males on the staff. In order to determine whether these variables affected the correlation between the IAS - All - P/out and innovativeness, partial correlation coefficients were computed. As a result it was found that the correlation between the SIS and the IAS - All - P/out with age held constant was .535, while the correlation between the SIS and the IAS - All - P/out with "maleness" held constant was .572. In each case there is a slight drop in the correlation, but each is still significant beyond the .01 level.

TABLE XXX

INTERCORRELATIONS AMONG THE IAS - ALL - P/OUT, THE SIS, AVERAGE AGE OF STAFF AND THE PROPORTION OF MALES ON THE STAFF

Variable	1	2	3	4
1. School Innovativeness Score	1.000	.596	-.316	-.300
2. IAS - All - P/out		1.000	-.430	-.467
3. Average Age of Staff			1.000	.238
4. Proportion of Males on Staff				1.000





### The Characteristics of Influentials

The analysis as presented thus far has shown that attitudes are significantly related to innovativeness in the schools in this sample. In particular, the attitudes of the influentials in the school are significantly correlated with innovativeness. When the sub-problem dealing with the attitudes of influentials was presented in Chapter I, a further sub-problem was presented which asked the following question: "What are the characteristics of the influentials in the various schools?" Some tentative answers to this question can be obtained by an examination of the data presented in Table XXXI, which shows how the characteristics, attitudes and practices of influentials compare with those of teachers in general. It can be seen from the table that influentials are much like other teachers in terms of their attitudes toward change. They are only slightly more innovative in practice than are teachers generally. They are somewhat less satisfied than are teachers in general. In terms of age and education they are very much like other teachers. The two youngest influentials in the sample were twenty-one years old, while the oldest was sixty-nine. However, influentials have generally been in their schools longer than their colleagues, and they have more total teaching experience. As many males as females are influentials, although there were only 30.99 per cent males in the total sample. About two-thirds of the influentials were married, which is slightly more than the number of married teachers generally. It is apparent from all this that a teacher may become an influential at almost any age, with or without a great deal of education beyond grade twelve, provided only that he or she is prepared to remain in the school long enough to attain a certain level of seniority, although





even this is not an absolute essential. In fact, 20.69 per cent of the influentials attained this status during their first year in their present schools. Only two persons, however, became influentials during their first year of teaching.

TABLE XXXI  
CHARACTERISTICS OF INFLUENTIALS AND TEACHERS

Characteristic	Influentials	All Teachers
Mean Score: Teacher Opinion Questionnaire	56.19	55.84
Mean Score: Teacher Practices Questionnaire	21.70	19.01
Mean Score: Teacher Satisfaction Questionnaire	19.71	21.00
Mean Age (Years)	36.19	35.68
Mean Education (Years Beyond Grade 12)	3.41	3.14
Mean Experience Present School	4.46	1.00+
Mean Total Experience	11.87	6.00+
Per Cent Males	51.26	30.99
Per Cent Married	67.80	61.26

It will be recalled that the average principal in this sample had been principal of his present school for five years. The average influential had been in his present school for a little less than this length of time.

### III. ANALYSIS OF SUB-PROBLEM III

Sub-Problem three asked: "Is innovativeness in schools related to the interaction patterns which are found in the various schools?" Three hypotheses were formulated under this sub-problem. The findings for each of these hypotheses are presented below.



Hypothesis 3.1 -- The amount of innovation which takes place in a school is related to the number of reciprocated communication links in the school.

Findings. Table XXXII shows that the Pearson-product moment correlation coefficient between the SIS and the SCS was .188. This correlation is too low for significance and the research hypothesis is not accepted. The amount of innovation which takes place in a school is not related to the amount of communication which takes place in the schools of the present sample.

TABLE XXXII

INTERCORRELATIONS AMONG THE SCHOOL INNOVATIVENESS SCORES,  
THE SCHOOL COMMUNICATION SCORES, THE SCHOOL RELIANCE  
SCORES, THE SCHOOL ATTRIBUTED INFLUENCE SCORES  
AND SCHOOL SIZE

Variable	1	2	3	4	5
1. School Innovativeness Score	1.000	.188	.230	.010	.010
2. School Communication Score		1.000	.683	.523	-.584
3. School Reliance Score			1.000	.736	-.715
4. School Attributed Influence				1.000	-.780
5. School Size					1.000

It was noted that there is a high negative correlation between school size and the SCS. The partial correlation coefficient was therefore computed for the SIS and the SCS with school size held constant. The resulting correlation was .239, which is still short of significance.

Hypothesis 3.2 -- The amount of innovation which takes place in a school is related to the number of reliance links in the school.

Findings. Table XXXII shows that the Pearson product-moment





correlation coefficient between the SIS and the SRS was .230, which is higher than the correlation between the SIS and the SCS, but which is still too low to be significant. However, it is noted that again there is a high negative correlation between school size and the SRS. When the partial correlation coefficient is computed with school size held constant, the correlation is raised to .339, which is near the .344 value required for significance at the .05 level using a two-tailed test. The failure of the correlation to reach the critical level, however, leads to the decision that the research hypothesis is not supported by the present analysis.

Discussion. Although Hypothesis 3.2 was not supported, the results were so near the level required for significance that some consideration should be given to the use of a one-tailed test in making the decision. The theoretical reasoning which led to the hypothesis in the first place implied that a positive relationship between the SIS and the SRS was to be expected. The decision not to accept the research hypothesis should therefore probably be a tentative one.

Hypothesis 3.3    The amount of innovation which takes place in a school is related to the amount of influence which is attributed to each other by the members of the staff.

Findings. The Pearson product-moment correlation coefficient for the SIS and the SAIS was .010, which indicates that there is virtually no relationship between innovativeness and the amount of attributed influence in a school. As with communication and reliance, there is a high negative correlation between school size and the SAIS, but the correlation between the SIS and the SAIS is still only .028 when school size is held constant. The research hypothesis is therefore not accepted.





There is no relationship between a school's innovativeness and the amount of influence which is attributed to each other by the members of the staff.

The partial correlations between innovativeness and each of the three interaction variables with school size held constant are summarized in Table XXXIII.

TABLE XXXIII  
CORRELATIONS BETWEEN INNOVATIVENESS AND INTERACTION  
VARIABLES WITH SCHOOL SIZE HELD CONSTANT

Interaction Dimension	Correlation Between Interaction and SIS	p (1-tailed)	p (2-tailed)
Communication (SCS)	.239	N.S.	N.S.
Reliance (SRS)	.339	.05	N.S.
Attributed Influence (SAIS)	.028	N.S.	N.S.

Discussion. In Chapter II the argument was put forward that interaction among sub-systems will increase when change and innovation disturb the steady state of the system making the development of a new steady state necessary. The analysis of hypotheses 3.1, 3.2 and 3.3, however, suggest that this may be true only for the reliance dimension.

In the analysis of hypothesis 2.1 it was found that the communications dimension is not a satisfactory dimension for the identification of influentials with respect to innovation. It was suggested that this may be due to the fact that communication in a system is concerned with many other matters in addition to innovation. This may also account for the finding that the amount of communication is not significantly higher



in innovative than in non-innovative schools.

The theoretical development in Chapter II is supported by the finding that interaction on the reliance dimension increases with innovativeness in a system.<sup>1</sup> It seems reasonable that this dimension should be important in this respect, for by seeking information and advice, the sub-systems are not only making it possible to make the necessary adaptations to new circumstances, but they are also availing themselves of the feedback mechanisms which help to ensure that the adjustments which they are making are, in fact, producing the desired effect in terms of developing a new steady state.

It was pointed out in Chapter III that in every system there are two forces at work, one force promoting change, the other providing stability for the system. The analysis of hypothesis 3.3 suggests that the stability of the system is provided by those members to whom influence is attributed.

#### IV. REGRESSION ANALYSIS

Following the testing of the hypotheses as described in the foregoing pages, two regression analyses were performed. The first was a step-wise regression using innovativeness as the criterion and twenty-two predictor variables, including a number of variables which did not form the basis of any of the hypotheses discussed up to this point. These variables are listed in Table XXXIV. (See Appendix C for the inter-correlation matrix for these variables.) The second analysis was a

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<sup>1</sup>This is assuming that a one-tailed test can be considered appropriate in the analysis of hypothesis 3.2.





TABLE XXXIV

RESULTS OF STEP-WISE REGRESSION ANALYSIS USING THE  
SCHOOL INNOVATIVENESS SCORE AS CRITERION VARIABLE  
(N = 33)

Order of Entry	Variable	Per Cent Variance Added	Significance of Added Variance	Per Cent of Accumulated Variance	Significance of Accumulated Variance
1	IAS - All - P/out	35.52	.00046	35.52	.00046
2	IAS - Rel- P/out	5.57	.05	41.09	.00058
3	IAS - Rel - P/in	2.96	N.S.	44.05	.00093
4	PAS (Principal Att.)	3.67	N.S.	47.72	.00114
5	IAS - All - P/in	6.72	.001	54.44	.00067
6	School Size	2.37	N.S.	56.81	.00092
7	SSS (Satisfaction)	1.89	N.S.	58.70	.00136
8	SCS (Communication)	2.83	N.S.	61.53	.00156
9	IAS - Attrib - P/in	2.33	N.S.	63.86	.00194
10	IAS - Com - P/out	1.69	N.S.	65.55	.00274
11	IAS - Com - P/in	2.57	N.S.	68.12	.00305
12	Proportion Married	2.45	N.S.	70.57	.00342
13	Exp. Within School	1.92	N.S.	72.48	.00428
14	Total Teaching Exp.	4.25	.01	76.73	.00279
15	SAS (School Attitudes)	1.29	N.S.	78.03	.00397
16	Average Age	0.84	N.S.	78.86	.00637
17	Average Education	0.58	N.S.	79.44	.01083
18	Proportion Males	1.64	N.S.	81.08	.01359
19	IAS - Attrib P/out	1.05	N.S.	82.13	.01984
20	Similarity	1.41	N.S.	83.54	.02602
21	SAIS (Attrib. Inf.)	3.49	.05	87.03	.01816
22	SRS (Reliance)	0.00	N.S.	87.03	.03603





multiple linear regression model employing the same criterion and predictors for the full model, and then using several combinations of variables in several restricted models.

### The Step-Wise Regression

Table XXXIV summarizes the results of the step-wise regression.

The variable which contributes most to the variance in innovativeness is the IAS - All - P/out. As was noted earlier, this is the mean score on the Teacher Opinion Questionnaire obtained by the influentials in the school, with the exception that the principal's score is not included. This variable accounts for 35.52 per cent of the variance in innovativeness in the schools in this sample.

The other variables which contribute significantly to the total variance are the IAS - Rel - P/out, the IAS - All P/in, total teaching, and the SAIS. It should be noted that at each step of the regression analysis, the variance accounted for by the variable under consideration is that portion of the total variance which has not already been accounted for by variables entered earlier in the analysis.

The IAS - Rel - P/out adds 5.57 per cent to the total variance not already accounted for by the IAS - All - P/out. This is an addition which is significant at the .05 level, and brings the total variance accounted for up to 41.09 per cent.

The next two variables entered into the analysis together added 6.63 per cent to the accumulated variance, which is not a significant addition. It brings the total accumulated variance up to 47.72 per cent. Both of these variables were further variations of the IAS, and both involved the principal in the derivation of the score. The second of these





variables was the Principal Attitude Score, which does not add significantly to the total variance even when 44.05 per cent of the variance has already been accounted for.

The fifth variable which was entered into the regression analysis was the IAS - All - P/in, which added 6.72 per cent to the total variance. This addition is significant at the .001 level. This is the first time that a score which involves the principal's attitude toward change adds significantly to the total variance.

The next eight variables did not add significantly to the total variance, but they did bring the total accumulated variance up to 72.48 per cent. Following this, the average number of years of total teaching experience was entered into the regression analysis. This variable added a significant proportion of the remaining variance to the total. The additional variance accounted for was 4.25 per cent, which is significant at the .01 level.

Variables 15 to 20, inclusive, did not add significantly to the total variance accounted for, but brought the accumulated variance up to 83.54 per cent. This left 16.46 of the variance in innovativeness to be accounted for. Of this, the SAIS accounted for 3.49 per cent, which is significant at the .05 level. It will be remembered that the SAIS correlated only .010 with the SIS, which led to the rejection of hypothesis 3.3. The finding that the SAIS adds significantly to the accumulated variance when there is only 16.46 per cent left to account for does not provide grounds for the acceptance of the original hypothesis.

The last variable entered into the analysis was the SRS, which added nothing to the accumulated variance.





The total variance accounted for by the twenty-three variables was 87.03 per cent. The significance of the total accumulated variance was .03603. It should be noted that some of the variables which were entered into the regression analysis during the later stages, and which did not add significantly to the total variance, might have done so had they been entered earlier. This is due to the fact that some of them had high correlations with variables entered earlier, and the variance which might have been accounted for by the later variables had already been accounted for by the earlier ones. For example, in the regression analysis the SAS does not add significantly to the total variance, even though the SAS correlates .314 with the SIS. This is due to the fact that the SAS correlates highly with all the other variables which involve attitudes. All of these other variables were entered into the regression analysis earlier than the SAS.

#### Multiple Linear Regression Analysis

As noted earlier, the multiple linear regression analysis used the same criterion as the step-wise regression analysis, namely the School Innovativeness Score. The multiple linear regression also used the same predictors in the analysis, but in somewhat different combinations. The results of these are summarized in Table XXXV.

Model 1, the full model, used all twenty-two predictors. These accounted for 86.94 of the variance in innovativeness. (This result is less than one-tenth of one per cent different from the total accumulated variance claimed in the step-wise regression analysis. The difference is probably due to rounding errors in the computation.)





TABLE XXXV

RESULTS OF THE MULTIPLE LINEAR REGRESSION ANALYSIS USING THE  
SCHOOL INNOVATIVENESS SCORE AS THE CRITERION VARIABLE  
(N = 33)

Predictor Variables	Criterion Variable	RSQ (full)	RSQ (restricted)	F	Significance of Decrease in RSQ
Attitude Variables in presence of all others	Innovativeness	.869	.588	1.79	.25
Non-Attitude Variables <sup>1</sup> in presence of all others	Innovativeness	.869	.392	2.60 <sup>2</sup>	.10

<sup>1</sup>The non-attitude variables included the following: school size, satisfaction, age, sex, marital status, education, experience in present school, total experience.

<sup>2</sup>An F-value of 2.86 is required for the decrease in RSQ to be significant at the .05 level.

Table XXXV reveals that there is not a significant decrease in the total variance when only attitude variables are used in the regression analysis. However, the decrease in variance when only non-attitude variables are included approaches significance at the .05 level. These results provide further evidence of the importance of the attitude variables as predictors of innovativeness.

#### V. ATTITUDES AND INNOVATIVENESS AS RELATED TO AGE, MARITAL STATUS AND SEX

Table XXXVI shows that there is a high negative correlation between the School Attitude Score and each of the following: age, marital status and sex. Each of these merits some attention.



TABLE XXXVI

INTERCORRELATIONS AMONG THE SCHOOL ATTITUDE SCORES, AVERAGE  
AGE OF TEACHERS, PROPORTION OF MARRIED TEACHERS ON STAFF,  
AND THE PROPORTION OF MALES ON THE STAFF

Variable	1	2	3	4
1. School Attitude Score	1.000	-.520	-.400	-.475
2. Average Age of Staff		1.000	.419	.238
3. Proportion Married			1.000	.387
4. Proportion Males				1.000

### Age

The Pearson product-moment correlation coefficient between age and the School Attitude Score is  $-.520$ . This is in keeping with the commonly held view that persons are less likely to favour change as they become older.

### Marital Status

Marital status also correlates highly with the School Attitude Score ( $r = -.400$ ). But since older teachers are more likely to be married than younger teachers, the partial correlation between the SAS and marital status was computed with age held constant. When this was done the partial correlation dropped to  $-.235$ , which is too low to be significant at the .05 level. The high negative correlation between the SAS and marital status is thus seen to be due to the effects of the age of the married teachers.

### Sex

An unexpected finding was that sex differences exist in terms of





attitudes toward change. The correlation between the proportion of males and the SAS was  $-.475$ . Since there was a positive correlation of  $.238$  between the proportion of males on the staff and the average age of the teachers, the partial correlation between sex and the SAS was computed holding the effects of age constant. The result was a slight drop in the correlation to  $-.423$ , but even this is significant beyond the  $.05$  level for a two-tailed test.

The above might lead to the conclusion that male teachers are less innovative than female teachers. To check on this possibility it was decided to divide the respondents into two groups on the basis of sex and to compute their mean scores for both attitudes and innovativeness. T-tests were then applied to determine whether the differences in means were statistically significant. The results, shown in Table XXXVII, indicate that there are no significant differences between the attitudes toward change displayed by men and women, but they do differ in innovativeness. However, the results of the t-tests appear to contradict the conclusions drawn from the simple correlation between the SIS and maleness. The apparent contradiction can be explained, however, when it is recalled that the "maleness" score for schools was taken to be the proportion of males on the staff. On re-examination of the data it was found that when males form a small proportion of the staff, they are more innovative than when they form a larger proportion of the staff. The lowest average score among the males on any one staff was  $14.63$ , which occurred in a school where over 40 per cent of the teachers were men. The findings with respect to innovativeness of the male teachers in schools with various proportions of males are summarized in Table XXXVIII.





TABLE XXXVII  
SEX DIFFERENCES IN ATTITUDES AND INNOVATIVENESS

Variable	Mean for Males	Mean for Females	Probability (2-tailed)
Score on on Teacher Opinion Questionnaire	55.16	56.28	.0764
Score on Teacher Practices Questionnaire	20.32	18.57	.0000

TABLE XXXVIII  
PROPORTION OF MALES AND INNOVATIVENESS OF MALES

Per Cent Males	No. of Schools	No. of Males	Mean Innovativeness Score for Males
Less than 10%	1	1	28.00
10 - 19%	1	5	22.20
20 - 29%	15	62	22.21
30 - 39%	10	67	19.34
40 - 49%	4	37	19.22
50% and over	2	21	18.81



## VI. SUMMARY OF THE CHAPTER

The analysis of hypotheses 1.1, 2.1, 3.1, 3.2 and 3.3 was presented in this chapter. Hypothesis 2.1 was accepted on the basis of the analysis of the data, while hypotheses 1.1, 3.1 and 3.3 were not accepted. In the case of hypothesis 3.2, the criterion for acceptance was not met inasmuch as the observed correlation between the SIS and the SRS was .339, while a correlation of .344 was required for significance using a two-tailed test. The suggestion was made that a one-tailed test could be considered appropriate for this hypothesis, and that the observed correlation was high enough to lead to the acceptance of the hypothesis using a one-tailed test.

The major finding which was reported in this chapter was that the attitudes toward change held by the influentials in a school are the best predictors of innovativeness among those selected for study. The one dimension of influence which appears to be of the greatest importance is the attributed influence dimension, while the dimension of least importance is the authority dimension.

Influentials were found to be much like their colleagues in terms of age and education, but they tended to have longer tenure in their present schools. They also tended to have more total teaching experience than their colleagues.

Older teachers were found to be less favorably disposed toward change than younger teachers, and the same was true for married teachers as compared to single teachers. A more complicated situation arose when the attitudes and innovativeness of males and females were compared. No significant differences between the sexes was apparent in attitudes, but males were found to be more innovative in the total sample, though less innovative in schools where the proportion of males to females was high.





## CHAPTER VI

### INTERACTION AND ATTITUDES

Chapter V was devoted to the analysis of those hypotheses which dealt with innovation. In the present chapter hypotheses 4.1, 4.2, 4.3 and 4.4 will be discussed. Each of these hypotheses deals with interaction in the system and the attitudes of the members of the system.

Three of the interaction dimensions which were described in Chapter II are used as the basis for the hypotheses dealing with interaction and attitudes. The communications dimension was used to derive the School Communication Score, which is the proportion obtained by summing the actual validated communication links in a school and dividing by the total number of possible links among the members. The reliance dimension was used to derive the School Reliance Score, which is obtained like the SCS with the exception that the reliance links do not have to be reciprocated to be valid. The attributed influence dimension was used to derive the School Attributed Influence Score in a similar manner.

Hypothesis 4.1 deals with communication and the similarity of attitudes toward change within the school. The similarity scores were the standard deviations for each school of the scores made by the teachers on the Teacher Opinion Questionnaire. Since greater similarity of attitudes results in a lower standard deviation, and thus a lower similarity score, a negative correlation involving these scores therefore indicates that a positive relationship exists between similarity and the other variable in question.





## I. ANALYSIS OF SUB-PROBLEM IV

Each of the hypotheses dealt with in this chapter was formulated under Sub-Problem IV which was worded as follows: "Is the interaction among the teachers in the school related to the attitudes with respect to change held by these teachers?"

Hypothesis 4.1 -- There is greater similarity of attitudes with respect to change in schools in which the communications network is well developed than in schools in which the communications network is not well developed.

Findings. Table XXXIX shows that the Pearson product-moment correlation coefficient between the SCS and the similarity scores for schools is  $-.182$ . The negative correlation is therefore in the predicted direction, but it is too small to justify rejection of the null hypothesis. The research hypothesis is therefore not accepted: there is no significant relationship between the similarity of attitudes in a school and the amount of communication which takes place within the school.

TABLE XXXIX

INTERCORRELATIONS AMONG SIMILARITY OF ATTITUDE SCORES,  
SCHOOL COMMUNICATION SCORES, SCHOOL RELIANCE SCORES,  
SCHOOL ATTRIBUTED INFLUENCE SCORES AND SCHOOL SIZE

Variable	1	2	3	4	5
1. Attitude Similarity	1.000	$-.182$	$-.325$	$-.359$	$.299$
2. Communication (SCS)		1.000	$.683$	$.523$	$-.584$
3. Reliance (SRS)			1.000	$.736$	$-.715$
4. Attributed Influence (SAIS)				1.000	$-.780$
5. School Size					1.000



Further Analysis. It was noted that there is a correlation of .299 between similarity of attitudes and school size. When the partial correlation coefficient between the SCS and similarity is computed with school size held constant the correlation drops to  $-.009$ . Similarly, when the partial correlation coefficient between similarity and school size is computed with the SCS held constant the result is a coefficient of .242, indicating that neither the SCS nor school size can alone account for a significant proportion of the variance in similarity of attitudes.

Table XXXIX also shows that there is a correlation of  $-.359$  between similarity and the SAIS, and a correlation of  $-.325$  between similarity and the SRS. But both of these correlations drop below the level of significance when the effects of school size are held constant, the former dropping to  $-.210$  and the latter to  $-.165$ .

Since neither school size nor interaction on any of the dimensions of communication, reliance and attributed influence were able to account for a significant proportion of the variance in the similarity of attitudes, it was decided to find out whether the length of tenure on present staff was associated with similarity of attitudes. The reasoning underlying this attempt was that the interaction process among those teachers who had been on the staff for longer than one year might have resulted in a certain amount of consensus with respect to innovation and change. Teachers in their first year on the present staff were therefore expected to include the majority of those teachers on the staff whose attitudes differed from those of the staff in general.

To test this possibility the teachers were categorized in two





groups, one composed of those teachers who were in their first year in their present schools and the other composed of those teachers with more than one year of tenure. Each of these groups was then further categorized into three groups on the basis of their attitudes toward change. The "attitude same" group was composed of those teachers whose attitude score was within one standard deviation of the staff mean. The "attitude similar" group had attitudes between one and two standard deviations from the mean, and the "attitude different" group included those whose attitudes were more than two standard deviations from the staff mean. The results were then entered into a two by three contingency table and tested for significance by means of the chi square test for independence. Table XL shows both the obtained and the expected frequencies in each category. The value of chi square for these figures is 0.73, which is below the value required for significance at the .05 level. It appears that attitudes toward change vary as much among teachers who have worked together for some time as among those who are on the staff for the first time.

Discussion. The foregoing analysis suggests that the similarity of attitudes toward change held by teachers cannot be explained on the basis of any of the variables used in this study. This raises questions about the theory on which the hypothesis was based. On theoretical grounds it was expected that a system in which a great deal of interaction was occurring among the members should show more similarity among member attitudes than a system in which little interaction is taking place. Similarly, it was expected that those who had been in mutual interaction for a longer period of time should show more similarity of attitudes than





those whose contact with a staff was of relatively recent origin.

TABLE XL

CONTINGENCY TABLE SHOWING RELATIONSHIP BETWEEN SIMILARITY  
OF ATTITUDES TOWARD CHANGE AND LENGTH OF TENURE ON STAFF

		Attitudes		
		Same	Similar	Different
More than One Year on Staff	Observed (Expected)	269 (274)	104 (100)	17 (16)
First Year on Staff	Observed (Expected)	208 (203)	69 (73)	11 (12)

A possible reason for the failure of the data to support these expectations is that interaction among teachers is probably concerned with many other topics in addition to change and innovation. If this is indeed the case, then the method of testing the theory should be changed to take this possibility into account. The sociometric questionnaire, for example, might be revised to ask specifically about interaction concerning change and innovation. It might then turn out that increased interaction is associated with similarity of attitudes with respect specifically to change. On the basis of the present data it is impossible to know whether the failure to obtain support for the hypothesis is due to a shortcoming in the theory or to an inadequate measuring technique.



Hypothesis 4.2 -- Teachers whose attitudes with respect to change differ from the attitudes held by the teachers as a group will be isolates in the communications network.

Analysis and Findings. An individual's TAS was considered different from his school's SAS when it was at least two standard deviations above or below the latter. Persons thus identified were divided into two groups, those who were isolates and those who were not isolates. Similarly, the teachers whose TAS scores were within two standard deviations of the SAS were divided into two groups, one composed of isolates and the other of non-isolates. (It should be recalled that an isolate was defined as a person who has no validated communication links with any other member of the staff.) The resulting data were entered into a fourfold contingency table and tested for significance by means of the chi square test for independence. The results, shown in Table XLI, reveal that there are no grounds for rejecting the null hypothesis. The value for chi square for the figures shown in the table is 2.324, which is near the value required for significance at the .05 level, but in the opposite direction to the one predicted. The research hypothesis is therefore not accepted.

Further Analysis. The test for hypothesis 4.2 was conducted with the operational definition of similarity as it was developed when the study was in the planning stage. Since this was a somewhat arbitrary definition, it was decided following the above analysis to provide a further test with several alternatives. The respondents were therefore divided into three attitude groups: the "attitude same" group for those whose attitude score was within one standard deviation of the staff mean, the "attitude similar" group for those whose TAS was between one and





two standard deviations from the staff mean, and the "attitude different" group composed of teachers whose TAS was more than two standard deviations from the staff mean. Each of these groups was further divided into three groups: the influentials, the isolates, and the regular teachers who were neither influentials nor isolates. The resulting data were entered into a three by three contingency table and tested for significance by means of the chi square test for independence. The results, shown in Table XLII, yield a value for chi square of 2.72, which is below the level required for significance at the .05 level. This indicates that, even with a more flexible definition of similarity, there is no support for hypothesis 4.2.

The failure of the above analyses to explain the presence in the schools of over 100 isolates in the communications networks led to a further analysis based on the expectation that teachers in their first year on a staff would be more likely to be isolates in the communications network than would teachers with longer tenure, and that the latter would be more likely to be influential in the communication network.

To test this possibility, the data were entered into a two by three contingency table as shown in Table XLIII and tested for significance by means of the chi square test for independence. The result was a value for chi square of 17.31, which is significant at the .001 level. Examination of the table will reveal, however, that this value for chi square is due mainly to the fact that relatively few first year staff members are influentials.

Discussion. It has already been suggested that the communications dimension is probably not a sensitive one for the purposes of the present





TABLE XLI

CONTINGENCY TABLES SHOWING NUMBER OF ISOLATES AND NON-ISOLATES  
IN THE COMMUNICATIONS NETWORK WHOSE ATTITUDES DIFFER FROM  
OR ARE SIMILAR TO THOSE OF THE TEACHERS AS A GROUP

	Isolates	Non-Isolates
Attitudes Similar to Group	115	549
Attitudes Different from Group	2	28

TABLE XLII

CONTINGENCY TABLE SHOWING RELATIONSHIP BETWEEN SIMILARITY OF ATTITUDES  
TOWARD CHANGE AND CLASSIFICATION AS AN INFLUENTIAL, A REGULAR  
TEACHER OR AN ISOLATE IN THE COMMUNICATIONS DIMENSION

		Attitudes		
		Same	Similar	Different
Influential	Observed (Expected)	49 (48)	16 (18)	4 (3)
Regular Teacher	Observed (Expected)	350 (354)	134 (132)	24 (22)
Isolate	Observed (Expected)	85 (82)	30 (30)	2 (5)



TABLE XLIII

CONTINGENCY TABLE SHOWING RELATIONSHIP BETWEEN LENGTH OF TENURE  
AND CLASSIFICATION AS AN INFLUENTIAL, A REGULAR TEACHER  
OR AN ISOLATE IN THE COMMUNICATIONS NETWORK

		Tenure	
		First Year	Longer Tenure
Isolates	Observed (Expected)	52 (47)	58 (63)
Regular Teachers	Observed (Expected)	223 (212)	277 (288)
Influentials	Observed (Expected)	13 (29)	55 (39)





analysis because communication in a school is probably concerned with a great many other topics in addition to change and innovation. This may account in part for the fact that hypothesis 4.2 was not supported, and may explain why it is even possible for persons with extreme attitude scores to be influentials.

One of the methodological problems which complicated the present analysis was the fact that some of the persons with extreme attitudes were not classed as isolates simply because they had communication links with others on the staff who formed a clique in isolation or semi-isolation from the main group. Occasionally persons with opposing attitudes were each linked to a third party, and thus qualified as members of the group. It was found, however, that persons with extreme and opposite attitudes never had communication links with each other.

Hypothesis 4.3 -- Teachers whose attitudes with respect to change differ from the attitudes held by the teachers as a group will not be relied on for advice by the other members of the staff.

Analysis and Findings. Differences in attitudes were computed as for hypothesis 4.2, and then the teachers were further separated into two groups on the basis of the reliance dimension. Those who were relied on for advice by one or more of their colleagues composed one group, while the other group was made up of persons who were not relied on for advice by any other member of the staff. The resulting data were entered into a fourfold contingency table and tested for significance by means of the chi square test for independence. The results, shown in Table XLIV, indicate that there are no grounds for rejecting the null hypothesis. The value for chi square for the figures shown in the table is .276, which





is below the value required for significance at the .05 level. The theoretical hypothesis is therefore not accepted.

TABLE XLIV

CONTINGENCY TABLE SHOWING THE RELATIONSHIP BETWEEN SIMILARITY  
OF ATTITUDES TOWARD CHANGE AND CLASSIFICATION  
ON THE RELIANCE DIMENSION

	Persons Relied On	Persons not Relied On
Attitudes Similar to Group	408	256
Attitudes Different from Group	17	13

Further Analysis. In order to provide a further test for the hypothesis it was decided to perform another analysis using the more flexible definition of attitude differences described earlier. The data were entered into a three by three contingency table as shown in Table XLV and tested for significance by means of the chi square test for independence. A value of 3.41 was obtained, which is still below the value required for significance at the .05 level.

The relationship between tenure and the teacher's standing as an isolate, an influential or a regular teacher in the reliance dimension was explored next. The data were arranged as shown in Table XLVI and tested by means of the chi square test for independence. A value of 44.16 was obtained, which is significant beyond the .001 level.

Discussion. As in the case of the previous hypothesis, the present analysis not only failed to support the hypothesis, but five of the persons who had attitudes which differed considerably from those of



TABLE XLV

CONTINGENCY TABLE SHOWING THE RELATIONSHIP BETWEEN SIMILARITY OF  
ATTITUDES TOWARD CHANGE AND CLASSIFICATION AS AN INFLUENTIAL,  
A REGULAR TEACHER OR AN ISOLATE ON THE RELIANCE DIMENSION

		Attitudes		
		Same	Similar	Different
Influential	Observed (Expected)	57 (59)	22 (22)	5 (4)
Regular Teacher	Observed (Expected)	238 (238)	93 (88)	10 (15)
Isolate	Observed (Expected)	189 (188)	65 (70)	15 (12)

TABLE XLVI

CONTINGENCY TABLE SHOWING THE RELATIONSHIP BETWEEN LENGTH OF TENURE  
AND CLASSIFICATION AS AN INFLUENTIAL, A REGULAR TEACHER  
OR AN ISOLATE ON THE RELIANCE DIMENSION

		Tenure	
		First Year	Longer Tenure
Isolates	Observed (Expected)	148 109	109 (148)
Regular Teachers	Observed (Expected)	121 (143)	216 (194)
Influentials	Observed (Expected)	19 (36)	65 (48)





the teachers as a group actually qualified as influentials on the reliance dimension. Two of these had attitude scores which were more than two standard deviations below those of the teachers as a group, while three others had scores more than two standard deviations above the mean. It would therefore appear that differences in attitudes toward change are not related to a teacher's ability to become an influential on the reliance dimension. Teachers seem to be willing to go for advice to persons whom they perceive to be expert even when these experts hold views which are widely different from those of the persons seeking the advice.

The present analysis also indicates that persons who are on the staff for the first time are more likely to be isolates on the reliance dimension than are teachers who have been on the staff longer than one year. It would appear that teachers have to prove themselves before they are perceived to be capable of giving sound advice. Probably, too, much of the advice which is sought is concerned with acceptable procedures in the school, and knowledge of these procedures is probably most appropriately sought from those who have the most familiarity with them.

Hypothesis 4.4 -- Teachers whose attitudes with respect to change differ from the attitudes held by the teachers as a group will not be perceived to be influential by the other members of the staff.

Analysis and Findings. Differences in attitudes were computed as for hypotheses 4.2 and 4.3, and then the teachers were further divided into two groups on the basis of the attributed influence dimension. Those to whom influence was attributed by one or more members of the staff composed one group, while those to whom no one attributed influence composed





the other group. The resulting data were entered into a fourfold contingency table and tested for significance by means of the chi square test for independence. The results, shown in Table XLVII, indicate that, as with the previous two hypotheses, there are no grounds for rejecting the null hypothesis. The value of chi square for the figures shown in the table is .449, which is below the value required for significance at the .05 level. The theoretical hypothesis is therefore not accepted.

TABLE XLVII

CONTINGENCY TABLE SHOWING THE RELATIONSHIP BETWEEN SIMILARITY  
OF ATTITUDES TOWARD CHANGE AND CLASSIFICATION  
ON THE ATTRIBUTED INFLUENCE DIMENSION

	Persons to whom Influence is Attributed	Persons to whom Influence is not Attributed
Attitudes Similar to Group	307	357
Attitudes Different from Group	12	18

Further Analysis. Two further analyses were again conducted, the first to see whether a more flexible definition of attitude difference would provide support for the hypothesis, and the second to determine the relationship between tenure and the teacher's standing on the attributed influence dimension. The chi square test for independence was again applied in both analyses. The data for the first analysis, shown in Table XLVIII, resulted in a value of 7.59 for chi square. This is below the value required for significance at the .05 level, and thus



supports the previous finding. Differences in attitude are not related to a teacher's position on the attributed influence dimension. Specifically, teachers with attitudes which differ from the attitudes of the other teachers on the staff are no more likely to be isolates on the attributed influence dimension than are teachers whose attitudes are similar to those held by their colleagues.

TABLE XLVIII

CONTINGENCY TABLE SHOWING THE RELATIONSHIP BETWEEN SIMILARITY OF ATTITUDES TOWARD CHANGE AND CLASSIFICATION AS AN INFLUENTIAL, A REGULAR TEACHER OR AN ISOLATE ON THE ATTRIBUTED INFLUENCE DIMENSION

		Attitudes		
		Same	Similar	Different
Influential	Observed (Expected)	78 (86)	36 (32)	9 (5)
Regular Teacher	Observed (Expected)	143 (137)	50 (51)	4 (9)
Isolate	Observed (Expected)	263 (261)	94 (97)	17 (16)

In order to determine the relationship between tenure and the teacher's standing on the attributed influence dimension, the chi square test for independence was applied to the data shown in Table II. The value of chi square for these data was 81.27, which is beyond the value required for significance at the .001 level. There is a definite relationship between tenure and a teacher's position on the attributed





influence dimension. First year teachers are much less frequently perceived to be influential than are teachers with longer tenure. In fact, 209 of the 288 first year teachers received no choices at all on the attributed influence dimension.

TABLE II

CONTINGENCY TABLE SHOWING THE RELATIONSHIP BETWEEN LENGTH OF TENURE AND CLASSIFICATION AS AN INFLUENTIAL, A REGULAR TEACHER OR AN ISOLATE ON THE ATTRIBUTED INFLUENCE DIMENSION

		Tenure	
		First Year	Longer Tenure
Isolates	Observed (Expected)	209 (152)	149 (206)
Regular Teachers	Observed (Expected)	55 (83)	141 (113)
Influentials	Observed (Expected)	24 (53)	100 ( 71)

Discussion. The results of the above analyses are much the same as those of hypotheses 4.2 and 4.3. They confirm the earlier results which indicate that holding different attitudes is not related to a teacher's position on the attributed influence dimension. In fact, nine of the persons with extreme attitude scores on the Teacher Opinion Questionnaire qualified as persons to whom influence was attributed by at least one quarter of the remainder of the teachers on their respective staffs. Four of these favoured change while the other five did not





favour change.

The failure of the data to support the three hypotheses just analyzed may be evidence that the theory on which the hypotheses were based is not adequate. It is more likely, however, that the particular application of systems theory to the highly specific topic of change is inappropriate in an educational organization which is concerned with many other system functions in addition to change and innovation.

While no relationship was found between a teacher's attitude and his nomination as an influential, a very definite relationship between tenure and such nomination was evident. Influentials have more tenure in their present schools and more total teaching experience than non-influentials. This is even more evident in the case of persons with extreme attitudes. Table L shows that those persons with extreme attitudes who qualified as influentials had an average of 8.1 years of experience in their present schools, while those who did not qualify had an average of only 2.6 years in their present schools. Similarly, those persons with extreme attitudes who qualified as influentials had slightly more total teaching experience than those who failed to qualify as influentials.

## II. SUMMARY

The analysis of hypotheses 4.1, 4.2, 4.3 and 4.4 was presented in this chapter. None of these hypotheses was supported by the data.

None of the predictors used in the analysis was able to account for a significant proportion of the variance in attitude similarity in the schools in the present sample, and none of the predicted relationships



existed between extremeness of attitudes toward change and the status of individuals in the group. While it had been expected that persons with extreme attitudes would tend to be isolates in the communications dimension, this did not turn out to be the case. Similarly, while it was expected that persons with extreme attitudes would not be relied on for advice, and that influence would not be attributed to them, no significant differences in the predicted directions were found. Indeed, it was even found that ten of the thirty teachers with extreme attitudes were influentials on one or more dimensions.

TABLE L

TENURE AND TOTAL EXPERIENCE OF INFLUENTIALS AND  
NON-INFLUENTIALS WITH EXTREME ATTITUDES

	N	Mean Length of Tenure in Present School	Mean Total Experience
Influentials with Extreme Attitudes	10	8.1 years	19.1 years
Non-Influentials with Extreme Attitudes	18	2.6 years	15.2 years
Non-Influentials not Reporting Experience	2		

A consistent finding was that tenure is related significantly to a teacher's position on the three interaction dimensions under consideration. Teachers who are on their staffs for the first time are much less likely to be influentials and more likely to be isolates than are those who have been on the staff for some time. While this is true for all three dimensions, the relationship is most pronounced on the attributed influence dimension.





## CHAPTER VII

### TEACHER SATISFACTION

The last sub-problem which was investigated in this study dealt with the satisfaction of teachers, and was worded as follows: "Is the satisfaction of teachers related to the congruence between their attitudes toward change and the amount of innovation in the school?" The findings related to this sub-problem will be discussed in this chapter.

Hypothesis 5.1 -- The satisfaction of teachers is related to the congruence between their attitudes toward change and the actual amount of innovation in the school.

Analysis and Findings. In order to test hypothesis 5.1 the teachers in the total sample were first divided into two groups on the basis of their schools' SIS scores. Those who were members of a staff whose SIS was at or above the mean for all schools were placed in one group, while those who were members of a staff whose SIS was below the mean for all schools were placed in the other group. These groups were then further divided on the basis of the TAS scores of the individual teachers. Those whose TAS was at or above the mean formed one group, while those whose TAS was below the mean formed the other group. The resulting four groups were then used with a two-factor analysis of variance design, in which the criterion was the score obtained by the teachers on the Teacher Satisfaction Questionnaire and the two factors used as predictors were the SIS and the TAS. The number of teachers in each group is shown in Table LI.





TABLE LI

BASIC DATA FOR TESTS OF DIFFERENCES BETWEEN TEACHER  
SATISFACTION WHEN SIS AND TAS ARE CONGRUENT  
AND WHEN SIS AND TAS ARE NOT CONGRUENT

Cell	N	Factor A (TAS)	Factor B (SIS)	Mean Satisfaction		
1	198	High	High	20.19		
2	179	High	Low	19.42		
3	145	Low	High	19.61		
4	156	Low	Low	19.60		

Source of Variance	SS	df	MS	F	P
Factor A	6.74	1	6.74	0.372	0.543
Factor B	31.49	1	31.49	1.738	0.187
Interaction	23.88	1	23.88	1.318	0.251
Error	12212.18	674	18.12		

On the basis of the hypothesis, it was expected that high satisfaction scores would be found in those cells of the table in which the SIS and the TAS were congruent, that is, in the High High and the Low Low groups. Again, it was expected that low satisfaction scores would appear in those cells of the table in which the SIS and the TAS were not congruent, that is, in the High Low and the Low High groups. Support for the hypothesis thus called for a significant interaction effect in the analysis of variance.

The findings do not support the hypothesis. Table LI shows that



there is no significant interaction. The research hypothesis is therefore not accepted. The satisfaction of teachers is not related to the congruence between their attitudes toward change and the actual amount of innovation in their schools.

Further Analysis. In addition to the failure of the data to support the hypothesis as stated, it will be seen from an examination of the data in Table LI that neither of the two factors used in the analysis of variance could alone account for a significant amount of the variance in satisfaction among teachers.

The Teacher Satisfaction Questionnaire consisted of six items. Two of these, Items 1 and 3, were more directly related to the actual working situation of teachers than were the others. It was therefore decided to perform two further analyses similar to the one just described, but using each of the two items just mentioned in a separate analysis.

Item 1 of the Teacher Satisfaction Questionnaire asked the respondents to check the one statement among six provided which best indicated their satisfaction with their present teaching position in all of its aspects. The responses to this item were used as the criterion with the same groups as in the analysis just described. The results were again insignificant. The p-value for the interaction was 0.294.

Item 3 of the Teacher Satisfaction Questionnaire asked the respondents to check one of the six statements in answer to the following question: "To what extent are you satisfied with the educational policies followed in your school as compared to policies that you feel





to be most desirable educationally?" The same groups were again used in the analysis, and with the same insignificant results. The p-value for the interaction was 0.601.

When it had been concluded that the data did not support the hypothesis even for those items of the Teacher Satisfaction Questionnaire which seemed most closely related to the issue in question, it was decided to return to the intercorrelation matrix for all variables used in the study (see Appendix C) to determine whether any of those variables were significantly related to teacher satisfaction. It was found that the only variable with a high correlation with satisfaction at the school level was the proportion of males on the staff. Table LII shows that the proportion of males on the staff was found to correlate  $-.383$  with the School Satisfaction Score. The next step taken was to check on this correlation by dividing the total sample according to sex, computing the mean satisfaction scores for males and females, and then performing a t-test. The results shown in Table LIII, indicate that there are no significant differences between males and females in terms of satisfaction when the analysis is performed at the individual level rather than the school level.

TABLE LII

CORRELATION BETWEEN PROPORTION OF MALES ON STAFF AND  
THE TEACHER SATISFACTION SCORES

Variable	1	2
1. School Satisfaction Score	1.000	$-.383$
2. Proportion of Males on Staff		1.000





TABLE LIII  
SEX DIFFERENCES IN TEACHER SATISFACTION

	Mean for Males	Mean for Females	P
Score on Teacher Satisfaction Questionnaire	20.00	19.66	0.3317

It will be remembered that males were found to be more innovative when they were on a staff with a small proportion of male colleagues, and that innovativeness among male teachers decreased as the proportion of males on the staff increased. The present analysis indicates that a similar relationship exists between sex and satisfaction. As a check on this possibility, the males in the sample were divided into two groups on the basis of their scores on the Teacher Satisfaction Questionnaire, those above the mean forming one group, and those at or below the mean forming the other. They were further divided on the basis of membership in school staffs, with membership in the seventeen schools with the lowest proportion of males forming one group, and membership in the sixteen schools with the highest proportion of males forming the other group. The resulting data were entered into a four-fold contingency table and tested for significance by means of the chi square test for independence. The results, shown in Table LIV indicate that the number of satisfied males is significantly higher in schools with a low proportion of males than in schools with a large proportion of males. The value of chi square for the data of Table LIV is 7.899, which is significant at the .01 level.



TABLE LIV

CONTINGENCY TABLE COMPARING SATISFACTION OF MALES  
WITH PROPORTION OF MALES ON STAFF

	No. of Males with High Satisfaction (above mean)	No. of Males with Low Satisfaction (at or below mean)
High Proportion of Males on Staff	51	88
Low Proportion of Males on Staff	43	33

Discussion. In the theoretical development presented in Chapter II it was stated that stress is produced in the system when the system is unwilling or unable to cope with the inputs into the system. It was suggested that demands with respect to change and innovation would lead to stress if these demand inputs were inconsistent with the attitudes toward change held by the members of the system. It was then hypothesized that this stress would manifest itself in expressed dissatisfaction on the Teacher Satisfaction Questionnaire.

The failure of the data to support the hypothesis may be interpreted in several ways. First it is possible that the theory on which the hypothesis was based is inadequate. There is evidence from other studies, however, that makes this an unlikely possibility. A more likely possibility is that, while the theory is sound, the reasoning by which the hypothesis was derived from the theory is faulty. Incongruency between attitudes toward change and system innovativeness may not be a sufficient source of stress to lead to dissatisfaction. Or, it may even be that, while stress is present, the assumption that this stress will





lead to an expression of dissatisfaction on a questionnaire such as the Teacher Satisfaction Questionnaire is not a valid one. Unfortunately the data of the present study make it impossible to determine conclusively which, if any, of these possibilities correctly explains the findings.

### Summary

The analysis for hypothesis 5.1 was presented in this chapter. The hypothesis suggested that teachers would be less satisfied when their attitudes toward change were incongruent with their school's actual level of innovativeness. The data did not support the hypothesis, and it was suggested that the reason for this failure was probably not due to the failure of the theory, but more likely to a failure in the reasoning which led from the theory to the specific hypothesis.

It was reported that the correlation of  $-.383$  between the proportion of males on the staff and satisfaction was due to the fact that males are more satisfied in schools in which the proportion of males is low, and not to any overall differences in satisfaction between males and females.





## CHAPTER VIII

### SUMMARY, CONCLUSIONS AND IMPLICATIONS

#### I. SUMMARY OF THE STUDY

##### The Problem

This study was designed to investigate factors related to innovation in educational organizations. Several sub-problems were studied, dealing with the following topics: (1) attitudes and innovativeness, (2) interaction and innovativeness, and (3) teacher satisfaction as related to congruence between attitudes toward change and system innovativeness.

Ten hypotheses were developed and tested. The theoretical framework from which the hypotheses were derived was supplied by general systems theory. The first five hypotheses dealt with attitudes and innovativeness. The next four dealt with interaction and innovativeness. Finally, the last hypothesis dealt with teacher satisfaction.

##### Instrumentation and Methodology

A number of instruments were used to collect the data which were needed to test the hypotheses. The Teacher Opinion Questionnaire was designed to determine the attitudes toward change in education held by the teachers and principals in the sample. The actual innovativeness of teachers was assessed by means of the Teacher Practices Questionnaire. A sociometric instrument called the Interaction Questionnaire was used to determine the nature and amount of interaction in each school in terms of communication, reliance, and attributed influence. The Teacher Satisfaction Questionnaire provided information regarding the satisfaction of



teachers with various aspects of their teaching situation. In addition, personal and demographic data were collected by means of the Teacher Background Information Questionnaire.

### The Sample

The sample consisted of 697 teachers and principals in thirty-three schools located in three large urban school districts.

### Results

Hypothesis 1.1, which stated that the amount of innovation in a school is related to the attitudes toward change held by the teachers in a school was not supported. The Pearson product-moment correlation coefficient between attitudes and innovativeness was .314, which is below the level required for significance when a two-tailed test is used.

Hypothesis 2.1 stated that the amount of innovation in a school is related to the attitude toward change held by the influentials in the school. This hypothesis was strongly supported, and accounted for 35 per cent of the variance in innovativeness in the sample. The Pearson product-moment correlation coefficient between the attitudes of influentials and school innovativeness was .512 when the principal was counted as one of the influentials, and .596 when the principal was not included. Each of these correlations is significant at the .01 level using a two-tailed test.

Hypothesis 3.1 stated that the amount of innovation in the school is related to the amount of communication which takes place among the teachers. The Pearson product-moment correlation for these two variables, however, was only .188. With school size held constant, the correlation





rose to .239, but the result was still too low for significance, and the hypothesis was therefore not accepted.

Hypothesis 3.2 stated that the amount of innovation in the school is related to the number of reliance links in the school. The Pearson product-moment correlation coefficient between these variables was .230, which is too low for significance. But when the correlation was computed with school size held constant, the result was .339, which is just below the level required for significance at the .05 level using a two-tailed test. If a one-tailed test is applied, this result is significant at the .05 level. Although the original design required the application of a two-tailed test, the theoretical reasoning which led to the hypothesis implied that a positive correlation was to be expected. The decision not to accept the hypothesis as supported by the data should therefore be regarded as tentative.

Hypothesis 3.3 dealt with the attributed influence dimension, and stated that the amount of innovation in the school is related to the amount of influence which is attributed to each other by the members of the staff. The Pearson product-moment correlation coefficient between innovativeness and the amount of attributed influence was .010, and rose to only .028 when school size was held constant. The hypothesis was therefore not accepted.

Hypothesis 3.4 stated that there would be greater similarity of attitudes with respect to change in schools in which the communication network is well developed than in schools in which the communication network is not well developed. A negative correlation was expected due to the manner of scoring the similarity variable. The result, a correla-





tion of  $-.182$  was in the expected direction but failed to reach the level required for significance. The hypothesis was therefore not accepted.

Hypotheses 3.5, 3.6 and 3.7 predicted that teachers whose attitudes toward change were different from the attitudes held by the teachers as a group within individual schools (a) would be isolates in the communications network, (b) would not be relied on for advice by the others in the school, and (c) would not be perceived to be influential by the other members of the staff. None of these hypotheses was supported by the data. In fact, ten of the thirty persons who had extreme attitudes were found to be influentials in their schools.

Hypothesis 4.1 stated that the satisfaction of teachers would be related to the congruence between their attitudes toward change and the actual amount of innovation in the school. The analysis, however, showed that the predicted relationship does not exist in the present sample.

## II. CONCLUSIONS AND IMPLICATIONS

### Conclusions

A number of conclusions may be drawn from the present study. It must be remembered, however, that these conclusions may be limited by a number of shortcomings which are common in studies of this kind. In particular, it should be kept in mind that those schools which decided not to participate in the study may differ in some unknown and systematic way from those which did participate. The fact that teachers were asked to provide information on a sociometric questionnaire may have led some of them to provide certain spurious information. For example, the



principal may have been nominated more frequently for the reliance and attributed influence dimensions than was warranted by the facts. Another factor which makes generalization somewhat hazardous is the fact that the sample was limited to schools enrolling grades one to nine only, and that over 40 per cent of the teachers in these schools were in their schools for the first time during the year of the study. With these cautions in mind, however, certain conclusions may be tentatively drawn from this study.

1. The first and most obvious conclusion is that the attitudes toward change held by the influentials in a school are definitely related to the amount of innovation which takes place in the school. In fact the attitudes of these influentials account for more of the variance in innovativeness than any other factor. The attitude toward change held by the principal, however, does not correlate significantly with the innovativeness of the school.

It should be kept in mind that the innovations which were used in the Teacher Practices Questionnaire were all available to all of the schools in the sample. It is not suggested that factors outside the school have no effect on a school's innovativeness. It is suggested, however, that when an innovation is available to a school, it is most likely to be adopted when the influentials in the school are in favour of change.

2. A more tentative conclusion may be drawn regarding the characteristics of the teachers who become influentials in a school. In the present sample, influentials were similar to other teachers in terms of age, education and sex. They have similar attitudes toward





change, although they appear to be somewhat more innovative in practice than their less influential colleagues. The main attribute which distinguishes influentials from other teachers is the fact that the former tend to have been in their present schools longer, and they also have more total teaching experience than non-influentials. Contrary to expectation, persons who have extreme attitudes, either for or against change, may become influentials, provided they have sufficient experience in their present schools. An interesting finding was that principals are less influential than the other influentials in the school, even though the former have generally been in their present schools longer.

The above conclusions concerning the characteristics of influentials should be accepted cautiously because of the nature of the sample. Since so many teachers were in their present schools for the first time, it may well be that experience within the school made it possible for more experienced teachers to become influential who would not have been able to achieve this position in schools where their colleagues had been on the staff for a greater length of time than was the case in the present sample.

3. The four interaction dimensions which were investigated in this study were the communications, reliance, attributed influence and authority dimensions. It has already been indicated that the authority dimension is relatively unimportant in terms of innovation in the present sample. Similarly, it appears that the communications dimension is not as important as had been expected. There was slightly more communication in innovative schools than in non-innovative schools, but the difference was too small to be significant statistically and may have been due to chance.





There was an increase in the amount of reliance in innovative schools over the amount observed in less innovative schools, although the increase failed to reach a statistically significant level when a two-tailed test was applied. In addition, it was found that teachers were willing to go for advice to others even when these others held different attitudes than those who were seeking the advice. This finding provides tentative support for the generalization based on systems theory which suggests that interaction in a system increases when change makes it necessary for the system to move in the direction of a new steady state after the original steady state has been disturbed by a change in the system. The interaction among the sub-systems provides the feedback which is necessary if the sub-systems are to make adjustments which are truly adaptive.

The attributed influence dimension did not show any significant increase when a school became more innovative. The same persons appear to be influentials in innovative and non-innovative schools, namely those who have been on the staff for some time. Presumably these persons provide stability for innovative and non-innovative systems alike.

4. The present study is inconclusive with respect to the development of similarity of attitudes among the members of a staff. It was expected that there would be greater similarity in schools where the communications dimension was well developed, but this did not turn out to be the case.

5. The predicted relationship between a teacher's attitude toward change and the probability that he would be an isolate on each of the communications, reliance and attributed influence dimensions did not





exist in this sample. It was found, however, that teachers were more likely to be isolates on each of these dimensions if they were on their present staff for the first time. Also, significantly more influentials were found in the ranks of those who had been on the staff for some time than among first year teachers.

6. It was tentatively concluded from the data in this study that satisfaction among teachers is not related to the congruence between teacher attitudes toward change and the amount of innovation in the school. It was suggested that incongruence between these factors does not lead to stress in the system, or, if it does, that the questionnaire used in this study did not serve to elicit responses which demonstrate that such stress exists. It seems likely that satisfaction is the result of a complex combination of factors, none of which was adequately measured in the present study.

#### Implications for Administrators

The findings of the present study have a number of important implications for practising administrators. It is usually assumed, for example, that one of the functions of the principal of a school is to provide leadership in his school. Presumably, then, the attitudes held by the principal should be important in determining the direction the school will take in matters as important as change and innovation. The fact that the principals in the present sample were not influential in this respect should be a matter of some concern to administrators, for it is possible that this situation is not unique, and that principals of schools enrolling other grades similarly do not influence the teachers in their schools on the topic of innovation.





Although it is not the purpose of this dissertation to prescribe action for principals who wish to increase the level of innovativeness in their schools, it may nevertheless be worthwhile to suggest several approaches which merit some thought, and possibly further investigation. It may be, of course, that even those principals who favour change and innovation have never really made a determined effort to do anything about it. As was pointed out in Chapter III, Hayes has suggested that administrators place too high a value on a smooth, cohesive, functioning unit (4, p. 46). While these principals may favour change, they may fear that the consequences of upsetting the steady state of their systems may be too high a price to pay for the advantages of innovation. If this fear is to be overcome, principals will have to develop what Harris has called a "tolerance for turbulence" (3, p. 61).

But what of those principals who have tried, and yet have failed, to achieve what they would consider to be a desirable level of innovativeness? The present study has several implications for them.

1. The importance of the interaction among teachers has been clearly established in this study. The influentials, in fact, were identified on the basis of their interaction with their colleagues. It would therefore seem essential for the principal to become knowledgeable about the dynamics of the interaction within their particular schools. As was noted in Chapter III, Chesler, Schmuck and Lippitt have found that ". . . principals with innovative staffs were found to be in tune with their teachers' feelings and values about education and better informed about their informal relationships" (2, p. 275). It appears therefore that the principal must not only find some way of identifying





the influentials in his school, but he must develop a relationship with them which makes it possible for him to work effectively with them.

2. A second implication which follows logically from the first is that the principal must find a way of enlisting the services of his influential teachers in promoting innovation. He need not assume that influentials who oppose specific changes are absolutely and finally opposed to innovation. Willower reports, for example, that older teachers with long tenure in a school frequently perceive change as threatening to their status within the school (7, p. 258). It would therefore seem important that such teachers be reassured in some manner that they are not likely to lose status as a result of change, particularly since these teachers have been found to be the influentials in this study. It may well be that these persons can be made to feel that their status is enhanced if they are given a leading role to play in the planning and implementing of change.

3. A final suggestion worthy of some consideration by central authorities is that they may find it possible to develop innovative schools over a period of time by hiring teachers who favour change, and by making a determined effort to retain their services long enough to make it possible for them to become influential members of their staffs. Rogers has suggested that principals might increase the innovativeness of their schools by hiring young teachers with a breadth of training and cosmopolite sources of information and travel patterns (6, p. 256). Other writers have suggested methods which might be useful in retaining the services of such teachers and encouraging them in their attempts at innovation. Chesler et al suggest, for example, that teachers should



be given more free time which might be used in planning new procedures, sharing ideas with others in informal meetings, observing their colleagues, and participating in workshops (2, pp. 276-277). And Brickell suggests that sending teachers to places where they can observe successful new programs in action provides a powerful stimulus for experimentation on the part of the observing teachers. (1, p. 27).

### Implications for Further Research

The present study has led to certain conclusions which have implications for further theoretical development and research. In addition, certain inconclusive results merit further attention. Some of these will be mentioned below.

1. It might be well to replicate certain aspects of the present study in schools in which the average tenure of teachers is higher than it was in the present sample. Some of the hypotheses which failed to gain support from the present data should have a better test in order to determine whether the failure was due to an inadequate theory, reasoning, measurement techniques, or sampling procedures. This is particularly true for those hypotheses which dealt with similarity of attitudes and the status of individuals with extreme attitudes.

2. Probably those parts of the study which showed significant findings should be replicated in schools enrolling grade patterns different from those in the present sample. There may well be significant differences in patterns of influence in schools in which the proportion of elementary grades is lower or absent altogether.

3. Some attempt should be made to determine whether the influence which is exerted by influential teachers in a school can flow





upward and influence the innovativeness of the school district as a whole. Possibly teachers who favour change create demands which lead school boards to invest in resources which make it possible for their teachers to exercise their creative inclinations. On the other hand, it may be that teachers are powerless to affect the innovativeness of the district, and that their effectiveness and influence is restricted to their own schools and to those innovations which are already available in the district.

4. Considerable attention has been given in the literature on organizations to the concept of bureaucracy, and a certain amount of research has been done to determine the effects of bureaucratization on a school. It seems appropriate soon to attempt a research project which will indicate whether highly bureaucratic schools are more or less innovative than non-bureaucratic schools. In addition, it would be interesting to know whether the method of identifying influentials which was used in the present study can be used to determine who decides whether a school shall be bureaucratic or not. It may be, for example, that in a highly bureaucratic school the principal is influential, while in a less bureaucratic system the teachers with long tenure assume a more important role. A study designed to provide answers to these questions should be valuable not only for purposes of extending the theory of organizations, but it would doubtless lead to insights which could be used to good advantage by practising administrators.





### III. CONCLUSION

The purpose of this study was to provide some tentative answers for the following question: "What are the factors which are related to innovation in educational organizations?" This is an important question for contemporary educators not only because of the increased tempo of change in society at large, but also because schools have not always been able to incorporate needed changes without considerable difficulty.

It should be pointed out that there is no implication in the foregoing that change and innovation are always desirable. It is suggested, however, that it is probably necessary for schools to maintain what Lippitt describes as ". . . a healthy state of changeability in adapting to changing conditions and in utilizing potentialities for creative improvement in group functioning and productivity." (5, p. 162). Whether or not specific innovations are desirable in any given situation will probably always have to depend upon the circumstances and on the judgment of the persons involved. Studies such as the present one should provide insight and information for the persons who must make such judgments, and should enable them to carry out their responsibilities with a little more assurance of success.



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## A P P E N D I C E S





## APPENDIX A

### QUESTIONNAIRES



## TO THE TEACHER

The purpose of these questionnaires is to provide data for a research project in connection with my doctoral studies at the University of Alberta. The study has been approved by ( . . . name of superintendent, assistant superintendent or deputy superintendent . . . ) for the ( . . . name of school district . . . ).

These questionnaires are being distributed in approximately forty to fifty schools in at least three school districts. The information which you provide will be held in the strictest confidence. No information about individual teachers or schools will be given either to the principals or to the superintendents.

You will note that a code number has been assigned to each staff member on the staff list which accompanies these questionnaires. Please use the appropriate code numbers whenever you refer either to yourself or to any other member of the staff.

Please complete every item, even when there is some doubt about the best response. Place the completed questionnaires in the envelope, but do not place your name on either the envelope or the questionnaires. Return the sealed envelope to the office. I shall return to pick up the envelopes two days after their distribution.

I want to thank you in advance for your assistance. As a former teacher I am keenly aware of the frequency with which teachers are asked to perform functions which are not directly related to their work. It is my hope that the indirect benefits to be gained by participation in research projects of this kind will, in time, make the time spent well worth while.

Sincerely,

John Wiens.





## INTERACTION QUESTIONNAIRE

### Directions

The purpose of this questionnaire is to provide information with respect to channels of communication, patterns of reliance, and so on.

It is important that your answers be independent so please do not discuss them with other teachers.

Please refer to the staff list for your school on which each staff member has been assigned a number. In completing this questionnaire please indicate yourself and other staff members by number only, not by name. This helps to ensure anonymity and facilitates computer analysis of the data. All the information given in this questionnaire will be held in confidence.

In each of the questions below, circle the number of each person with whom you interact in the way specified. There are no lower or upper limits to the number of choices for each question. Choose as few or as many people as you feel are necessary to reply fully. Please circle "none" if this is your answer.

School Code No. \_\_\_\_\_ Teacher Code No. \_\_\_\_\_

1. During the course of a typical school week, in school or out of school, with which individuals are you most likely to discuss general school matters (teaching duties, school events, school policies, new practices, school program, students, etc.)?

01	02	03	04	05	06	07	08	09	10	11	12	13
14	15	16	17	18	19	20	21	22	23	24	25	26
27	28	29	30	31	32	33	34	35	36	37	38	39
40	41	42	43	44	45	46	47	48	49	50	None	

(Please go on to the next page.)





2. If you had a problem concerning any aspect of your work in this school (for example, concerning teaching materials, examinations, discipline, new practices, school records, extra-curricular activities, teaching methods, etc.), from whom would you likely seek advice?

01 02 03 04 05 06 07 08 09 10 11 12 13  
 14 15 16 17 18 19 20 21 22 23 24 25 26  
 27 28 29 30 31 32 33 34 35 36 37 38 39  
 40 41 42 43 44 45 46 47 48 49 50 None

3. In your opinion, which individuals are most influential in this school?

01 02 03 04 05 06 07 08 09 10 11 12 13  
 14 15 16 17 18 19 20 21 22 23 24 25 26  
 27 28 29 30 31 32 33 34 35 36 37 38 39  
 40 41 42 43 44 45 46 47 48 49 50 None

4. During the course of a typical school week, in school or out of school, with which individuals are you most likely to socialize informally?

01 02 03 04 05 06 07 08 09 10 11 12 13  
 14 15 16 17 18 19 20 21 22 23 24 25 26  
 27 28 29 30 31 32 33 34 35 36 37 38 39  
 40 41 42 43 44 45 46 47 48 49 50 None

(Please go on to the next questionnaire.)



## TEACHER OPINION QUESTIONNAIRE

Directions

This questionnaire consists of a number of statements of opinion with respect to change in education. Please indicate your agreement or disagreement with each of the statements by circling the appropriate symbols to the right of the statements. The symbols have these meanings:

SA -- strongly agree  
 A -- agree  
 U -- undecided  
 D -- disagree  
 SD -- strongly disagree

It is important that your answers be independent so please do not discuss them with other teachers. All the information given in this questionnaire will be held in the strictest confidence.

-----  
 School Code No. \_\_\_\_\_ Teacher Code No. \_\_\_\_\_  
 -----

- |  |                                 |
|--|---------------------------------|
| 1. Most schools are not changing rapidly enough to ensure that pupils will receive an education which prepares them adequately for the modern world. | SA      A      U      D      SD |
| 2. An experienced teacher seldom finds it necessary to make any important changes in his methods from one year to the next.                          | SA      A      U      D      SD |
| 3. Many of the changes which have been introduced into education recently have tended to complicate matters unnecessarily.                           | SA      A      U      D      SD |

(Please go on to the next page.)





- |     |  |    |   |   |   |    |
|-----|--|----|---|---|---|----|
| 4.  | A major characteristic of a professional teacher is that he likes to try new ideas in his teaching.                                      | SA | A | U | D | SD |
| 5.  | In general, experiments in education should be made only when there is evidence that similar experiments have been successful elsewhere. | SA | A | U | D | SD |
| 6.  | The trouble with most innovations in education is that they sound fine (sic) in theory but do not work out too well in practice.         | SA | A | U | D | SD |
| 7.  | In recent years, teachers have sometimes been forced to go along with changes which were of very little benefit to their pupils.         | SA | A | U | D | SD |
| 8.  | In a well-organized school it should not be necessary to review major policies more than once every two or three years.                  | SA | A | U | D | SD |
| 9.  | Even the best curriculum needs frequent revision .   | SA | A | U | D | SD |
| 10. | Teachers should not be expected to adopt new methods when the methods which they are presently using are working well for them.          | SA | A | U | D | SD |
| 11. | During the last few years there has been a tendency for people to exaggerate the need for change in schools.                             | SA | A | U | D | SD |

(Please go on to the next page.)





3

- |     |  |    |   |   |   |    |
|-----|--|----|---|---|---|----|
| 12. | Experimental changes should only be attempted in a school when there is evidence that present methods are inadequate.  | SA | A | U | D | SD |
| 13. | It is desirable that teaching practices should change over a period of time.   | SA | A | U | D | SD |
| 14. | It is better for a teacher to use methods which he has found to be useful than to take a chance on methods whose usefulness has not been established.  | SA | A | U | D | SD |
| 15. | Schools with firmly established traditions are more likely to be successful than are schools which do not have such traditions.  | SA | A | U | D | SD |
| 16. | For the long-term welfare of the school it is probably better to have teachers who are willing to follow established policies than to have teachers who constantly challenge these policies. | SA | A | U | D | SD |

(Please go on to the next questionnaire.)



## TEACHER PRACTICES QUESTIONNAIRE

Directions

In this questionnaire you are asked to indicate to what extent, if at all, you are involved in the various practices described by each of the items. Please place an X in the appropriate brackets under each item.

-----

School Code No. \_\_\_\_\_ Teacher Code No. \_\_\_\_\_

-----

1. How much use do you make of television as a teaching aid?

- (        ) I use it frequently.
- (        ) I use it reasonably often.
- (        ) I rarely use it.
- (        ) I never use it.

2. How many planned interviews have you had during the teaching day, (that is, while classes would normally be in progress), between September 1, 1966 and December 31, 1966?

- (        ) I have had such interviews with at least one of the parents of most or all of my pupils.
- (        ) I have had such interviews with at least one of the parents of about half of my pupils.
- (        ) I have had such interviews with at least one of the parents of fewer than half of my pupils.
- (        ) I have had no such interviews during that time.

3. In many districts the central office appoints consultants, subject supervisors, etc., who are responsible for providing a variety of services for teachers. Although such persons often visit teachers as a matter of routine, they may also make special visits when asked to do so by the teacher. Between September 1, 1966 and February 1, 1967, how many such visits did you ask for?

- (        ) three or more
- (        ) two
- (        ) one
- (        ) none

(Please go on to the next page.)





4. Many large school districts operate one or more "Instructional Services Centres" where teachers may obtain assistance with special projects, and from which they may obtain special equipment on loan.
- (a) Between September 1, 1966 and February 1, 1967, how many visits did you make to such a centre?
- (        ) three or more  
(        ) two  
(        ) one  
(        ) none
- (b) During this time, on how many occasions did you obtain the services of such a centre without a visit to the centre being necessary?
- (        ) three or more  
(        ) two  
(        ) one  
(        ) none
5. How many teachers in your own school have you observed while they were teaching between September 1, 1966 and February 1, 1967?
- (        ) three or more  
(        ) two  
(        ) one  
(        ) none
6. To what extent are you involved in team teaching?
- (        ) All of my teaching is organized around the team teaching approach.  
(        ) Most of my teaching is organized around the team teaching approach, but some subjects are handled by myself without reference to a teaching team.  
(        ) Team teaching plays only a small part in my teaching week.  
(        ) I am not involved in team teaching at all.

(Please go on to the next page.)





3

7. In how many of the subjects or classes which you teach are you involved with experimental units or courses of study?
- (        ) I am involved in at least three experimental courses or units.
  - (        ) I am involved in two experimental units or courses.
  - (        ) I am involved in one experimental unit or course.
  - (        ) I am not involved in any such experiments.
8. When was the last time that you took part in an in-service education project during the school year? (This refers to projects organized by the ATA, the school district, or by groups of teachers within a school or a group of schools.)
- (        ) this school year
  - (        ) 1965 - 1966
  - (        ) 1964 - 1965
  - (        ) prior to the 1964 - 1965 school year, if at all
9. Please check each of the following pieces of equipment which you have used at least twice between September 1, 1966 and February 1, 1967:
- (        ) tape recorder
  - (        ) filmstrip or slide projector
  - (        ) movie projector
  - (        ) record player
  - (        ) overhead projector
10. Please describe briefly any new idea or approach which you are using for the first time this year.
11. Please name any new or unusual piece of equipment which you have developed or are using this year.

(Please go on to the next questionnaire.)



## TEACHER SATISFACTION QUESTIONNAIRE

School Code Number \_\_\_\_\_

Your Number \_\_\_\_\_

- (1) Please check the one statement below which best indicates your satisfaction with your present teaching position in all of its aspects.
- \_\_\_\_\_ It is difficult to imagine a more satisfactory teaching situation.  
\_\_\_\_\_ This teaching situation is one of the best that I know of.  
\_\_\_\_\_ I consider this among the better teaching situations.  
\_\_\_\_\_ This teaching situation is better than average.  
\_\_\_\_\_ This teaching situation is only slightly better than average.  
\_\_\_\_\_ I consider this among the poorer teaching situations.
- (2) Please check the one statement below which best indicates your satisfaction with the social relationships among the teachers.
- \_\_\_\_\_ It is difficult to imagine a group with better social relationships.  
\_\_\_\_\_ Social relationships among the teachers are unusually good.  
\_\_\_\_\_ The group has better than average social relationships.  
\_\_\_\_\_ Social relationships are probably slightly above average.  
\_\_\_\_\_ This group is about normal for teachers in social relationships.  
\_\_\_\_\_ It would be much more pleasant if the social relationships were better.
- (3) To what extent are you satisfied with the educational policies followed in your school as compared to policies that you feel to be most desirable educationally? (Check one).
- \_\_\_\_\_ The educational policies followed here are the best that I can imagine.  
\_\_\_\_\_ The educational policies followed here are unusually good.  
\_\_\_\_\_ In general the educational policies followed here are very good.  
\_\_\_\_\_ The educational policies followed here are good in general but a few should be improved.  
\_\_\_\_\_ Some of the educational policies followed here are undesirable although many are satisfactory.  
\_\_\_\_\_ I consider many of the educational policies here to be undesirable.
- (4) What would probably be your reaction if you were offered a non-teaching position at an increase in salary of \$500 per school year? Assume that the position being offered is one in which you would use your academic training and that, in general, your abilities would be well suited to the job. (Check one).
- \_\_\_\_\_ I would take the job.  
\_\_\_\_\_ I would seriously consider it and might well decide to take it.  
\_\_\_\_\_ I would consider it but do not know whether or not I would decide to take it.  
\_\_\_\_\_ I would consider it but I would be unfavorably inclined from the outset.  
\_\_\_\_\_ I would not even make further inquiry about the job.





- (5) How plentiful do you feel employment opportunities are in non-teaching positions for persons of your sex with your particular subject-matter training? Consider only non-teaching jobs with salaries about the same as, or better than, teaching jobs. (Check one).
- ☐ There are so many opportunities of this type in my field that those teachers who are attracted have a wide choice.
  - ☐ There are enough opportunities that a teacher in my field has little difficulty finding one.
  - ☐ There are enough opportunities that one may be found in a reasonable length of time.
  - ☐ There are few such opportunities for teachers in my field.
  - ☐ Opportunities of this type are very scarce for teachers in my field.
- (6) In what manner does the administration in your school react when teachers express criticisms of the school's educational policies in faculty meetings? (Check one).
- ☐ The administration urges teachers to express such criticisms and warmly receives them.
  - ☐ The administration encourages criticisms and receives them in a fair manner.
  - ☐ Criticisms are accepted by the administration without prejudice to the teacher.
  - ☐ Criticisms are listened to by the administration but sometimes in a rather cool manner.
  - ☐ Criticisms are sometimes listened to by the administration but not very graciously.
  - ☐ The administration does not like criticisms to be expressed and disregards them when they are made.





## TEACHER BACKGROUND INFORMATION QUESTIONNAIRE

School Code No. \_\_\_\_\_ Teacher Code No. \_\_\_\_\_

Age \_\_\_\_\_

Sex: 1. M. \_\_\_\_\_ 2. F. \_\_\_\_\_

Marital Status: Single \_\_\_\_\_ Married \_\_\_\_\_

Divorced \_\_\_\_\_ Widowed \_\_\_\_\_

Years of Education: Count all education beyond Grade 12,  
including university, teacher training,  
normal school, etc.) \_\_\_\_\_Years of Education Recognized for Salary Purposes: \_\_\_\_\_Years of Teaching Experience: (Count this year as a full year.)

(a) This school \_\_\_\_\_ (b) Other schools in this district \_\_\_\_\_

(c) Other schools not in this district \_\_\_\_\_ (d) Total \_\_\_\_\_Years as Principal: (Count this year as a full year.)

(a) This school \_\_\_\_\_ (b) Other schools in this district \_\_\_\_\_

(c) Other schools not in this district \_\_\_\_\_ (d) Total \_\_\_\_\_(e) Were you on the staff of this school (as teacher, vice-  
principal, etc.) immediately prior to becoming a principal?

Yes \_\_\_\_\_ No \_\_\_\_\_

(Please go on to the next page.)



Present Position: (Check most appropriate one.)

- classroom teacher
- part-time relieving teacher
- librarian, non-teaching or teaching only library  
classes
- librarian, teaching regular classes
- principal, non-teaching
- principal, teaching half time or less
- principal, teaching more than half time
- vice-principal, teaching more than half time
- vice-principal, teaching half time or less
- (Other (specify) \_\_\_\_\_  
\_\_\_\_\_

Grades Taught:

1. Underline all the grades you teach.

Grade: 1 2 3 4 5 6 7 8 9

2. Underline the grade in which you spend most of your time.

Grade: 1 2 3 4 5 6 7 8 9





## PRINCIPAL OPINION QUESTIONNAIRE

Directions

A number of new practices have been introduced into some schools during the last few years. Some of these may be useful while others may be of questionable usefulness in elementary schools. Whether or not your school is involved with these practices, please indicate how you feel about them by placing an X in the appropriate set of brackets under each item.

-----  
School Code No. \_\_\_\_\_  
-----

1. In your opinion, how useful is television as a teaching aid?

(     ) extremely useful  
(     ) quite useful  
(     ) somewhat useful  
(     ) not useful

2. In your opinion, are parent-teacher interviews useful enough to justify freeing teachers during the school day in order to make such interviews possible?

(     ) definitely  
(     ) probably  
(     ) probably not  
(     ) definitely not

3. In your opinion, how useful are the services of school board consultants, district appointed subject supervisors, etc., for classroom teachers?

(     ) extremely useful  
(     ) quite useful  
(     ) somewhat useful  
(     ) not useful

(Please go on to the next page.)





4. In your opinion, how useful are the services of centrally located "Instructional Materials Centres"?
- ☐ extremely useful
  - ☐ quite useful
  - ☐ somewhat useful
  - ☐ not useful
5. In your opinion, is it a good idea for teachers to visit each others' classrooms from time to time in order to observe each others' teaching?
- ☐ definitely
  - ☐ probably
  - ☐ probably not
  - ☐ definitely not
6. In your opinion, is team teaching preferable to the more traditional approach?
- ☐ definitely
  - ☐ probably
  - ☐ probably not
  - ☐ definitely not
7. In your opinion, is it a good idea for the ordinary classroom teacher to experiment with new units or courses before these have been adopted by the whole school system?
- ☐ definitely
  - ☐ probably
  - ☐ probably not
  - ☐ definitely not
8. In your opinion, should teachers take part in in-service education projects during the school year?
- ☐ definitely
  - ☐ probably
  - ☐ probably not
  - ☐ definitely not

(Please go on to the next page.)



9. Please rate each of the following according to your opinion of their usefulness to classroom teachers. Assign a four (4) if you consider an item as extremely useful, a three (3) if you consider it quite useful, a two (2) if you consider it somewhat useful, and a one (1) if you consider it not useful.

- (     ) tape recorder
- (     ) filmstrip and/or slide projector
- (     ) movie projector
- (     ) record player
- (     ) overhead projector





## DIRECTIONS FOR SCORING QUESTIONNAIRES

Teacher Opinion Questionnaire

Items 1, 4, 9 and 13 were scored positively, with a score of five being assigned to the "strongly agree" category and a score of one being assigned to the "strongly disagree" category. The remaining items were scored negatively.

A teacher's opinion score was the sum of the scores on the individual items.

Teacher Practices Questionnaire

All the items except the last were scored from one to four, depending on the amount of use made of the particular practice by the responding teacher. If a teacher failed to respond to one of the items it was scored "one" on the assumption that no use was being made of the innovation. The last item was scored from zero to five, depending on the number of items checked.

The score for an individual teacher on the Teacher Practices Questionnaire was the sum of the scores of the individual items.

Teacher Satisfaction Questionnaire

Items 1, 2, 3, 5 and 6 were scored positively, with a score of one being assigned to the last statement in each item. Item 4 was scored negatively, with a score of one being assigned to the first statement in the item.

A teacher's satisfaction score was the sum of the scores on the individual items.





Principal Opinion Questionnaire

Items 1 to 8 were scored positively, with a score of four being assigned to the first response category, and a score of one being assigned to the lowest response category. The score for Item 9 was the average of the ratings for each of the pieces of equipment named in the item.

The principal's score on the questionnaire was the sum of the scores of the individual items.



APPENDIX B

PRINCIPAL'S RATINGS OF TEACHERS WITH RESPECT  
TO ATTITUDES TOWARD CHANGE





PRINCIPAL'S RATINGS OF TEACHERS WITH RESPECT  
TO ATTITUDES TOWARD CHANGE

Instructions

Teachers vary considerably with respect to their attitudes toward change. The following categories have been suggested:

- Category 1 includes those who are constantly eager to try new ways of doing things, even when there is no evidence to indicate that the new method is an improvement over the old.
- Category 2 includes those who are usually among the first to try a new method when there is at least some evidence to indicate that it is an improvement over the old.
- Category 3 includes those who are not often among the first to try a new method, but who are quite willing to adopt the new method when its advantages have been firmly established.
- Category 4 includes those who try new methods cautiously, and who generally accept change only after they are encouraged to do so by the example of the majority.
- Category 5 includes those who rarely try new methods, and who usually accept change only when they are virtually forced to do so.

-----

Consider the attitudes of the members of your staff.

Although you may have very little direct evidence to support your decision, please indicate which category you think best describes each of the members of your staff. Enter the number of the appropriate category beside the name of the teacher on the staff list.





APPENDIX C  
CORRELATION MATRIX



INTERCORRELATION MATRIX  
(N = 33)

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1. SIS	1.000	-.168	.010	.236	.365	.506	.218	.512	.230	.558	.571	.596	.010	.214	-.316	-.300	-.215	-.082	.180	-.250	.314	.188	.230
2. Similarity		1.000	-.359	.227	.103	-.053	.153	-.013	.024	-.020	-.199	-.142	.299	.277	.094	.187	.257	.287	-.055	.136	-.263	-.182	-.325
3. SAS			1.000	.048	.041	.103	.000	.116	.082	.042	.145	.178	-.780	.007	-.052	-.138	-.294	-.052	.189	.132	.070	.523	.736
4. IAS - Com - P/in				1.000	.478	.475	.493	.555	.851	.341	.312	.442	.097	.075	-.199	-.257	-.132	.016	.042	-.115	.167	.137	.073
5. IAS - Rel - P/in					1.000	.805	.855	.794	.314	.780	.525	.577	-.065	.179	-.334	-.562	-.125	-.122	-.086	-.201	.591	.251	.238
6. IAS - Attrib - P/in						1.000	.753	.964	.412	.647	.880	.873	-.046	.293	-.419	-.584	-.196	-.218	-.058	-.332	.675	.356	.391
7. PAS - Prin. Attitude							1.000	.747	.259	.414	.375	.428	.080	.209	-.286	-.395	-.137	-.131	-.121	-.204	.508	.149	.110
8. IAS - All - P/in								1.000	.514	.640	.800	.917	-.015	.195	-.428	-.503	-.237	-.142	-.018	-.319	.684	.351	.370
9. IAS - Com - P/out									1.000	.346	.354	.526	.044	-.044	-.156	-.291	-.297	.023	-.107	-.087	.278	.151	.132
10. IAS - Rel - P/out										1.000	.605	.628	-.166	.040	-.261	-.519	-.150	-.040	-.008	-.129	.485	.207	.302
11. IAS - Attrib - P/out											1.000	.881	-.146	.323	-.365	-.579	-.157	-.237	-.004	-.301	.551	.387	.500
12. IAS - All - P/out												1.000	-.092	.159	-.430	-.467	-.243	-.115	.058	-.311	.632	.411	.469
13. School Size													1.000	.020	.075	.263	.368	.178	-.036	.021	-.035	-.584	-.715
14. SSS														1.000	.089	-.383	-.040	-.149	-.029	-.093	.322	-.253	.061
15. Average Age															1.000	.238	.419	.115	.526	.788	-.520	-.391	-.257
16. Proportion Males																1.000	.387	.532	.042	.237	-.475	-.344	-.490
17. Proportion Married																	1.000	.236	.144	.415	-.400	-.262	-.373
18. Average Education																		1.000	.198	.203	-.077	-.276	-.166
19. Experience Present School																			1.000	.677	-.197	.064	.066
20. Total Teaching																				1.000	-.445	-.252	-.092
21. SAS																					1.000	.204	.303
22. SCS																						1.000	.683
23. GDS																							1.000

r required for significance: .292 (.05 level, 1-tailed); .404 (.01 level, 1-tailed);  
.344 (.05 level, 2-tailed); .442 (.01 level, 2-tailed)













**B29889**